



In the United States Patent and Trademark Office

Appeal No: 2005-0378  
Serial No: 09/232,566  
Appn. Filed: 01/15/99  
Applicant: Rolf Jansen  
Appn. Title: Tractor/Trailer Back-up Kit  
Examiner/GAU: Tung Vo/2613

Mailed: 9-3-05  
At: Houston, Texas

REQUEST FOR REINSTATEMENT OF THE APPEAL

Sir:

Applicant/appellant, Rolf Jansen, pro se, requests reinstatement of his appeal to the Board of Patent Appeals and Interferences, in accordance with 37 CFR Sect 1.193(b)(2)(ii).

This request is appropriate for the following reason:

The Board issued a Decision On Appeal, mailed February 8, 2005, that stated: "The decision of the examiner to reject claims 3 and 4 is reversed."

However, on June 22, 2005, the examiner mailed a new Office Action that again rejected claims 3 and 4, after the Board of Patent Appeals and Interferences had decided the case.

Enclosed is Appellant's 2nd Supplemental Brief, in triplicate, for the purpose of replying to the examiner's Office Action. The appellant encloses herewith check for \$170.00, the small entity fee for filing a brief.

Petition to Make Special, for Reason IV-Applicant is over 65 years of age, was granted 11/27/04. He is now age 72.

Very respectfully,

*Rolf Jansen*

Rolf Jansen, appellant, pro se

P.O. Box 73161

Houston, Tx 77273-3161

Certificate of Mailing

I certify that this correspondence will be deposited with the United States Postal Service as first class mail with proper postage affixed in an envelope addressed to "Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" on the date below.

Date: 9-3-05

Rolf Jansen  
Rolf Jansen, appellant, pro se  
P.O. Box 73161  
Houston, TX 77273-3161  
281-440-6907

In the United States Patent and Trademark Office

Appeal No: 2005-0378  
Serial No: 09/232,566  
Appn. Filed: 01/15/99  
Applicant: Rolf Jansen  
Appn. Title: Tractor/Trailer Back-up Kit  
Examiner/GAU: Tung Vo/2613

Mailed: 9-3-05

At: Houston, Texas

APPELLANT'S 2ND SUPPLEMENTAL BRIEF

Applicant/appellant, Rolf Jansen, pro se, wishes to inform the Board of Patent Appeals and Interferences of the following:

1

The Board issued a Decision On Appeal, mailed February 8, 2005, that stated: "The decision of the examiner to reject claims 3 and 4 is reversed."

However, on June 22, 2005, the examiner mailed a new Office Action that again rejected claims 3 and 4. Copy of the Office Action is attached as Exhibit 1.

Attached as Exhibit 2 are copies of 37 CFR Sect 1.198, Section 1.196, and Section 1.114.

Section 1.198, titled Reopening after decision, states as follows:

"Cases which have been decided by the Board of Patent Appeals and Interferences will not be reopened or reconsidered by the primary examiner except under the provisions of Section 1.114 or Section 1.196 without the written authority of the Director, and then only for the consideration of matters not already adjudicated, sufficient cause being shown."

09/12/2005 HAHHEI 00000089 09232566

01 FC:1999 170.00 DP

The exception in Section 1.114, titled Request for continued examination, states:

"(a) If prosecution in an application is closed, an applicant may request continued examination of the application by filing a submission and the fee set forth in Section 1.17(e)..."

The applicant/appellant has never requested a continued examination of the application, nor has he filed a submission, nor has he paid the set fee.

Section 1.114(d) further states: "An appeal brief under Section 1.192 or a reply brief under Section 1.193(b), or related papers, will not be considered a submission under this section."

Therefore, the exception of Section 1.114 does not apply in this case.

The exception in Section 1.196, titled Decision by the Board of Patent Appeals and Interferences, comes into being only if the Board makes a new ground of rejection. In this case the Board did not make a new ground of rejection.

In the Office Action, mailed June 22, 2005, there is no mention of the examiner having received the written authority of the Director to reopen after decision of the Board of Patent Appeals and Interferences.

Yet, in spite of the clear language of 37 CFR Sect 1.198, the examiner rejected claims 3 and 4 again, after the Board of Patent Appeals and Interferences had decided the case.

2

This is why it is appropriate that the appellant bring this matter to the attention of the Board of Patent Appeals and Interferences.

In accordance with Section 1.193(b)(2)(ii) of 37 CFR, the appellant filed simultaneously his Request for Reinstatement of the Appeal and Appellant's 2nd Supplemental Brief, in triplicate, and submitted payment of the fee for filing a brief.

3

Petition to Make Special, for Reason IV-Applicant is over 65 years of age, was granted on November 27, 2004. He is now age 72.

4

What the Office Action states in regard to claim 4:

"2. The following is a quotation of the second paragraph of U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claim 4, line 3, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP Section 2173.05(d).

Claim 4, Line 8, "the ideal position" is indefinite. It is not clear that which position of the camera is mounted. Appropriation correction is required.

7. Claim 4 would be allowable if rewritten or amended

to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action."

5

Here is the wording of claim 4:

"4. An assembly of a micro-video, pin-holed lens camera, comprising means for mounting said assembly on the reverse side of a plate, such as a license plate, at the rear of a trailer or motor vehicle, so that said camera can see through a predetermined-sized hole put in said plate, whereby said plate-mounted assembly conceals said pin-holed lens camera to lessen the risk of vandalism, whereby said camera is located in the ideal position at the rear of a trailer or motor vehicle for viewing a backing when used in conjunction with a monitor."

6

Appellant's response pertaining to rejection of claim 4:

A. The examiner issued three previous Office Actions, dating back to the year 2000, and never objected to the words to which he now objects. An inference can be drawn that the words are not objectionable; otherwise, the examiner would have objected to them before now.

Instead, he brings the objection for the first time over 4 months after the Board of Patent Appeals and Interferences had decided the case.

B. A license plate is one particular type of plate. If the appellant were to write his claim to pertain to only a license plate, some one could easily evade a patent by hiding the tiny camera behind a plate that says, THINK SAFETY, or THIS VEHICLE MAKES WIDE RIGHT TURNS.

C. Quoting from Manual of Patent Examining Procedure, Section 2173.02, on page 2100-199 (copy attached as Exhibit 3).

"The mere use of the phrase "such as" in the claim does not by itself render the claim indefinite. Office policy is not to employ per se rules to make technical rejections. Examples of claim language which have been held to be indefinite set forth in MPEP Section 2173.05(d) are fact specific and should not be applied as per se rules. The test for definiteness under 35 U.S.C. 112, second paragraph is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification."

The appellant asserts that a person skilled in the art would understand claim 4.

D. Here is an explanation as to why the appellant used the term "ideal position" in claim 4:

Why put the camera behind a plate, such as the trailer license plate?

First, the little camera stays out of sight.

The plate can easily be centered and mounted just under the rear edge of the trailer floor.

If you mount the camera by either back-up light, the driver won't have a balanced center view.

If you mount the camera on the trailer roof, the field of view of the lens won't see any of the area close to the rear of the trailer, which is crucial to see when backing to a loading dock.

If you mount the camera along the back edge of the trailer floor, a slight bump against the loading dock will damage the camera.

"Ideal position" is an appropriate term because the position described is ideal by objective criteria.

Further, the appellant asserts that a person skilled in the art would understand this part of claim 4.

E. After the U.S. Supreme Court ruled in Festo v Shoketsu, 122 S.Ct. 1831 (2002), there are dire consequences if an applicant changes the wording of a claim to satisfy an examiner.

A copy of this case is attached as Exhibit 4. Quoting from page 3 of 12, Key Cite this headnote (10):

"Patentee alleging infringement under doctrine of equivalents has burden of proving that narrowing amendment made during patent prosecution did not surrender particular equivalent in question."

Quoting from page 8 of 12, at the bottom of major caption A:

"On the other hand, if a section 112 amendment is necessary and narrows the patent's scope -- even if only for the purpose of better description -- estoppel may apply. A patentee who narrows a claim as a condition for obtaining a patent disavows his claim to the broader subject matter, whether the amendment was made to avoid the prior art or to comply with section 112." (Emphasis added.)

F. So, the appellant states right now that he declines to accept the examiner's offer to allow claim 4 if the applicant/appellant makes changes to claim 4 at this late stage.

G. The appellant very respectfully requests that the Board of Patent Appeals and Interferences reverse the examiner's rejection of claim 4.



7

What the Office Action states in regard to claim 3:

"1. In view of the newly discovered references, DE 33 16 818, US 6,259,475, and US 6,172,600, PROSECUTION IS HEREBY REOPENED."

Response:

This clearly shows the examiner has reopened prosecution in spite of 37 CFR Section 1.198, after the Board of Patent Appeals and Interferences had decided the case.

The examiner has not given a single word of explanation in the body of the Office Action as to why these two patents (US 6,259,475 and US 6,172,600) in combination with DE3316818 warrant rejecting claim 3.

The appellant has read US 6,259 (Ramachandran, et al), 40 pages, and US 6,172,600 (Kakinami, et al), 19 pages; and he asserts that neither of them shows the applicant/appellant's invention or renders it obvious, when combined with DE3316818, to which the appellant will respond in text further down in this brief.

8

What the examiner states in the Office Action additionally in regard to claim 3:

"5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hans-Hellmut Ernst (DE 33 16 818) in view of Lee (US 5,680,123).

Re claim 3, Ernst teaches an assembly of a camcorder-type crystal display monitor (elements 1-8 of the figure) comprising means (element 7 of figure) for mounting said assembly (elements 1-6 and 8 of the figure) to the inner retracted side of a driver's sun-visor (see the translation of DE 33 16 818, page 4 lines 1-10) a motor vehicle, whereby said sun-visor, when lowered, allows a driver easy, direct, close-range, sun-light-protected viewing of said monitor screen (see the translation of DE 33 16 818, page 4, line 19, page 5, line 2), as if the screen were a rear-view mirror (element 2 of the figure), when used in conjunction with a video phone (element 11 of the figure). Ernst further suggests means of connecting socket (element 6 of the figure) earphones (element 9 of the figure), game-pilot lever 11 or external devices can be connected to provide video telephone signal to the display (element 2 of the figure).

It is noted that Ernst does not particularly teach the screen display, when used in conjunction with a video camera to see to see to the rear when the unaided view is obstructed as claimed.

However, Lee teaches video cameras (62, 64, and 66 of fig. 5), a third video camera (66 of fig. 6) mounted on a rear the vehicle to view an object present in the rear region of the

vehicle (C fig. 1a), wherein the rear image is transmitted to a display monitor placed in the front of the vehicle for a driver viewing (74 of fig. 5), so this suggests the screen display, when used in conjunction with a video camera to see to the rear when unaided view is obstructed.

Therefore, taking the teachings of Ernst and Lee as a whole, it would have been obvious to one of ordinary skill in the art to modify the video cameras (62, 64, and 66 of fig. 6) of Lee into the assembly of the camcorder-type crystal display monitor of Ernst to detect and display objects not readily visible to the vehicle operator.

Doing so would allow the driver to view the hidden object captured by the camera without turning his or her head in the blind spot."

9

Here is claim 3:

3. An assembly of a camcorder-type liquid crystal display monitor, comprising means for mounting said assembly to the inner retracted side of a driver's sunvisor of a motor vehicle,

whereby said sunvisor, when lowered, allows a driver easy, direct, close-range, sunlight-protected viewing of said monitor screen, as if the screen were a rear-view mirror, when used in conjunction with a video camera, to see to the rear when the unaided view is obstructed.

10

Appellant's Response

Please notice that only the first page of the translation is attached to the German patent, DE 33 16 818, copy of which

is attached as Exhibit 5. This is the way the reference came in the mail from the PTO.

Attached as Exhibit 6 is copy of appellant's Request for Copy of Missing Reference, with card showing it was received by the PTO on July 5, 2005. Two months have since passed, and still the appellant has not received a copy of the translation.

The appellant does not read German. Translations of foreign patents are not available through the Patent and Trademark Depository Library, at Fondren Library, Rice University, Houston, Texas.

When the examiner in rejecting claim 3 refers to specific parts of the translation of a German patent (DE 33 16 818), giving page numbers, certainly the appellant is entitled to a complete copy of the translation in order to prepare a response, and to have the copy for his records.

Since the appellant has not received the translation of the German patent except for the 1st page of at least 5 pages in spite of writing to request the translation and waiting for 2 months to receive it, the appellant respectfully urges the Board not to consider any arguments the examiner might present in an Answer that relate to this translation.

Also, the appellant never received a copy of the examiner's Answer to Appellant's Supplemental Brief. Appellant learned on October 29, 2004, from correspondence from a lawyer in the Commissioner's Office, pertaining to a partial refund of a fee payment, that the examiner had filed an Answer on August 16, 2002.

Appellant sent a Notice of Non-Receipt of Examiner's Answer, with corroborating documentation, to the PTO on November 1, 2004, and return card showed the PTO received

said Notice on November 5, 2004. The appellant had requested that he be sent a copy of the examiner's Answer.

All of this transpired when the case on appeal was on the docket, and appellant had received notification from the Board that Examiner's Answer had been received and that appellant had filed no Reply brief. Very distressing! He couldn't file a Reply brief because he had never received a copy of the Examiner's Answer.

To this date the appellant has never received a copy of the Examiner's Answer to Appellant's Supplemental Brief.

A pattern has developed wherein the appellant is not receiving copies of very important documents from the PTO that bear on the appellant's ability to defend claims.

11

Continuing Appellant's Response

A. Please notice that in the drawing of the sun visor in Ernst (DE 33 16 818), the attachment post (where the sun visor attaches to the interior body of the car) is on the right.

In the United States cars drive on the right side of the road, and the passenger's sun visor mounts on the right.

Ernst (DE 33 16 818) is a German patent. On which side of the road do cars travel in Germany?

Quoting from Car Driving Information for Germany (obtained over the Internet), that is attached as Exhibit 7:

"Rules of the Road. Traffic travels on the right..."

So, the sun visor in Ernst is the passenger's sun visor; and the examiner is mistaken in stating that it is the driver's sun visor.

B. The examiner states that Ernst (DE 33 16 818) has a camcorder-type liquid crystal display. The appellant plans to prove that he is in error:

The term camcorder-type liquid crystal display (LCD) indicates that it shows video (motion pictures) and is small and thin.

Video is absolutely essential to claim 3; otherwise, the display monitor could not show the actual view of the area to which the driver is backing.

On a camcorder the LCD serves as the electronic viewfinder (EVF).

Quoting from Newnes Television and Video Engineer's Pocket Book, Third Edition, by Eugene Trundle, TMIIE (elect.), MRTS, MISTC, published in 1999, copy of 4 pages of which is attached as Exhibit 8:

From page 149:

"Colour EVF. The fact that colour viewfinders struggle to do justice to the performance of a good video camera has not prevented manufacturers incorporating them in home-movie camcorders! A few models offer the best of both worlds, with a conventional black-and-white VF tube plus a small (4-10 cm diagonal) colour LCD display in a fold-out panel on one side of the camcorder body."

From page 148:

"The norm then, is a black-and-white viewfinder tube of about 2.5 cm diagonal mounted in a 'chicken-leg' housing hinged at its back end on the top surface of the camera. It has an eyepiece and viewing lens with focus adjustment."

Further down page 148:

"Although physically very small, the components and

techniques of the EVF are just the same as are used in the TV receiver and monitors covered in the first half of this book."

Now quoting from Troubleshooting and Repairing Camcorders, by Homer L. Davidson, published in 1990 by McGraw-Hill, Inc., copy of 5 pages of which is attached as Exhibit 9:

From page 92:

"THE ELECTRONIC VIEWFINDER

Although the most recent camcorders have the electronic viewfinder, some of the smaller cameras have the optical viewfinder. The electronic viewfinder (EVF) permits monitoring the image being shot or played back. The electronic viewfinder looks and acts somewhat like the small black-and-white TV chassis. The EVF unit is found at the front of the camcorder (FIG. 3-35).

"The EVF circuits consist of a miniature picture tube with horizontal and vertical deflection circuits. The flyback transformer provides high voltage to the CRT. Vertical and horizontal sync circuits are generated and fed to the EVF deflection and VCR system control circuits. A small amplifier and sync separation circuit round up the EVF circuits (FIG. 3-36)."

FIG. 3-35 and 3-36 are included in Exhibit 9.

Why was no mention made of LCD viewfinders in this 1990 edition?

Appellant wishes to make a very short quote from another source, and then will answer the question.

Quoting from Practical Electronics for Inventors, by Paul Scherz, published by McGraw-Hill in 2000, copy of 3 pages of which is also attached as part of Exhibit 9:

From page 521:

"One disadvantage with LCDs is their slow switching speeds (time it takes for a new digit/character to appear)."

For an LCD to show video (motion pictures) it must have a high switching speed (refresh rate), or else the picture will be badly blurred.

To make an LCD viewfinder (camcorder-type liquid crystal display) technology must advance to greatly increase switching speed and incorporate all of the components of a TV receiver into a small package.

Why no mention of LCD viewfinders in Troubleshooting and Repairing Camcorders, published in 1990? In 1990 they were not yet available.

Now please take a look at the first page of Ernst (DE 33 16 818). The filing date is May 7, 1983, long before 1990. LCD viewfinders (camcorder-type liquid crystal displays) that show video certainly were not available in 1983.

Therefore, Ernst (DE 33 16 818) does not have a camcorder-type liquid crystal display, and the examiner is in error to state that it does.

Further, appellant will show that Ernst (DE 33 16 818) can't show the other kind of video based on the CRT (cathode ray tube). He will show that Ernst can't show any video:

The only TVs or video monitors available in 1983 were of the CRT type. All of them are bulky, impossible to mount within the confines of the thickness of a passenger's sun visor.

To corroborate this, attached as Exhibit 10 is copy of 2 pages from Consumer Reports, June 2005, and quoting from p. 46:



"BULKY. Most CRTs' depth equals their screen size."

So, Ernst (DE 33 16 818) pertains to no TV, no video of any kind.

C. A copy of Lee (US 5,680,123) is attached as Exhibit 11. Lee states in its Abstract the following:

"The vehicle monitoring system uses a plurality of video cameras mounted on various location of a vehicle to detect and display of objects not readily visible to the vehicle operator. In particular, video cameras are placed on each side of the vehicle and, preferably, on the rear portion of the vehicle. Each camera is connected to a display unit and/or video recorder through a video multiplexer which is controlled by a main controller. The views from different cameras are displayed or recorded in response to the position of a turn signal control switch. Alternatively, the cameras can be activated when a vehicle alarm is triggered or when the vehicle is hit from the behind."

In Lee, a display unit is mounted in the center of the dashboard. The patent does not tell specifically where a camera in the rear is placed.

D. The person of ordinary skill in the art is not obviously going to think of claim 3 because of his knowledge of Ernst and Lee, because claim 3 depends on video, and Ernst has no video of any kind, and Ernst pertains to a passenger's sun visor, and claim 3 pertains to a driver's sun visor.

E. The appellant very respectfully request that the Board of Patent Appeals and Interferences reverse the examiner's decision rejecting claim 3.

12

Appellant has reviewed each of the references, listed on the Notices of References Cited, that was not relied upon. Appellant asserts that none of them shows the appellant's invention or renders it obvious.

Conclusion: Appellant submits that this application is now in full condition for allowance, which action he very respectfully solicits.

WHEREFORE, the appellant very respectfully requests that the Board of Patent Appeals and Interferences:

- (1) Reverse the examiner's decision rejecting claims 3 and 4.
- (2) Order the examiner to allow claims 3 and 4, as written, within a specific time limit that the Board determines is appropriate, taking into consideration that the appeal from Final Rejection was initiated by the appellant on June 28, 2001, and the appellant is now age 72.

Very respectfully,

*Rolf Jansen*

Rolf Jansen

Appellant, pro se

P.O. Box 73161

Houston, Texas 77273-3161

281-440-6907

Verification

Appellant, Rolf Jansen, pro se, hereby declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the

knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Rolf Jansen

Rolf Jansen

Appellant, pro se

Date of signature: 9-3-05

Certificate of Mailing

I certify that this correspondence will be deposited with the United States Postal Service as first class mail with proper postage affixed in an envelope addressed to: "Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" on the date below.

Date: 9-3-05

Rolf Jansen

Rolf Jansen

Appellant, pro se



# UNITED STATES PATENT AND TRADEMARK OFFICE

EXHIBIT 1

7 PAGES

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/232,566	01/15/1999	ROLF JANSEN		1686

7590

06/22/2005

ROLF JANSEN  
P O BOX 73161  
HOUSTON, TX 77273

EXAMINER
----------

VO, TUNG T

ART UNIT	PAPER NUMBER
----------	--------------

2613

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**



Application No.

09/232,566

Applicant(s)

JANSEN, ROLF

Examiner

Tung Vo

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3 and 4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3 and 4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. In view of the newly discovered references, DE 33 16 818, US 6,259,475, and US 6,172,600, PROSECUTION IS HEREBY REOPENED.

#### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Regarding claim 4, line 3, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 4, line 8, "the ideal position" is indefinite. It is not clear that which position of the camera is mounted. Appropriation correction is required.

#### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 2613

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hans-Hellmut Ernst (DE 33 16 818) in view of Lee (US 5,680,123).

Re claim 3, Ernst teaches an assembly of a camcorder-type crystal display monitor (elements 1-8 of the figure), comprising means (element 7 of figure) for mounting said assembly (elements 1-6 and 8 of the figure) to the inner retracted side of a driver's sun-visor (see the translation of DE 33 16 818, page 4 lines 1-10) a motor vehicle, whereby said sun-visor, when lowered, allows a driver easy, direct, close-range, sunlight-protected viewing of said monitor screen (see the translation of DE 33 16 818, page 4, line 19, page 5, line 2), as if the screen were a rear-view mirror (element 2 of the figure), when used in conjunction with a video phone (element 11 of the figure). Ernst further suggests means of connecting socket (element 6 of the figure) earphones (element 9 of the figure), game-pilot lever 11 or external devices can be connected to provide video telephone signal to the display (element 2 of the figure).

It is noted that Ernst does not particularly teach the screen display, when used in conjunction with a video camera to see to the rear when unaided view is obstructed as claimed.

However, Lee teaches video cameras (62, 64, and 66 of fig. 5), a third video camera (66 of fig. 6) mounted on a rear the vehicle to view an object present in the rear region of the vehicle (C fig. 1a), wherein the rear image is transmitted to a display monitor placed in the front of the vehicle for a driver viewing (74 of fig. 5), so this suggests the screen display, when used in conjunction with a video camera to see to the rear when unaided view is obstructed.

Art Unit: 2613

Therefore, taking the teachings of Ernst and Lee as a whole, it would have been obvious to one of ordinary skill in the art to modify the video cameras (62, 64, and 66 of fig. 6) of Lee into the assembly of the camcorder-type crystal display monitor of Ernst to detect and display objects not readily visible to the vehicle operator.

Doing so would allow the driver to view the hidden object captured by the camera without turning his or her head in the blind spot.

***Allowable Subject Matter***

7. Claim 4 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

***Contact Information***

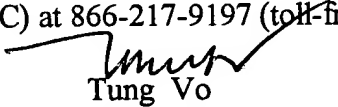
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung Vo whose telephone number is 571-272-7340. The examiner can normally be reached on Monday-Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Art Unit: 2613

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Tung Vo  
Primary Examiner  
Art Unit 2613

  
ACTING DIRECTOR  
TE 2600

**Notice of References Cited**

Application/Control No.

09/232,566

Applicant(s)/Patent Under

Reexamination

JANSEN, ROLF

Examiner

Tung Vo

Art Unit

2613

Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,259,475 B1	07-2001	Ramachandran et al.	348/148
	B	US-6,172,600 B1	01-2001	Kakinami et al.	340/435
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	DE 3316818	11-1984	GERMAN	Ernst	B60J 3/00
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

Copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

# EXHIBIT 2

3 PAGES

§1.198

## U.S. Patent and Trademark Office, Commerce

amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) The Board of Patent Appeals and Interferences may require appellant to address any matter that is deemed appropriate for a reasoned decision on the pending appeal. Appellant will be given a non-extendable time period within which to respond to such a requirement.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See §1.136(b) for extensions of time to take action under this section in a patent application and §1.550(c) for extensions of time in a reexamination proceeding.

[49 FR 48453, Dec. 12, 1984, as amended at 54 FR 29552, July 13, 1989; 58 FR 54510, Oct. 22, 1993; 62 FR 53197, Oct. 10, 1997]

### §1.197 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the application will be returned to the examiner, subject to appellant's right of appeal or other review, for such further action by appellant or by the examiner, as the condition of the application may require, to carry into effect the decision.

(b) Appellant may file a single request for rehearing within two months from the date of the original decision, unless the original decision is so modified by the decision on rehearing as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for rehearing must state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which rehearing is sought. See §1.136(b) for extensions of time for seeking rehearing in a patent application and §1.550(c) for extensions of time for seeking rehearing in a reexamination proceeding.

(c) Termination of proceedings. (1) Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§1.304) except:

(i) Where claims stand allowed in an application; or

(ii) Where the nature of the decision requires further action by the examiner.

(2) The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the Court or review by civil action (§1.304) expires. If an appeal to the Court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is issued by the Court. A civil action is terminated when the time to appeal the judgment expires.

The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.

(35 U.S.C. 6, Pub. L. 97-247; 15 U.S.C. 1113, 1123)

[46 FR 29184, May 29, 1981, as amended at 49 FR 48453, Dec. 12, 1984; 54 FR 29552, July 13, 1989; 58 FR 54510, Oct. 22, 1993; 62 FR 53198, Oct. 10, 1997; 68 FR 71006, Dec. 22, 2003]

### §1.198 Reopening after decision.

Cases which have been decided by the Board of Patent Appeals and Interferences will not be reopened or reconsidered by the primary examiner except under the provisions of §1.114 or §1.196 without the written authority of the Director, and then only for the consideration of matters not already adjudicated, sufficient cause being shown.

[65 FR 14873, Mar. 20, 2000]

a patent application and § 1.550(c) for extensions of time for requesting an oral hearing in a reexamination proceeding.

(c) If no request and fee for oral hearing have been timely filed by appellant, the appeal will be assigned for consideration and decision. If appellant has requested an oral hearing and has submitted the fee set forth in § 1.17(d), a day of hearing will be set, and due notice thereof given to appellant and to the primary examiner. A hearing will be held as stated in the notice, and oral argument will be limited to twenty minutes for appellant and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins. If the Board decides that a hearing is not necessary, the Board will so notify appellant.

[62 FR 53197, Oct. 10, 1997]

**§ 1.195 Affidavits or declarations after appeal.**

Affidavits, declarations, or exhibits submitted after the case has been appealed will not be admitted without a showing of good and sufficient reasons why they were not earlier presented.

[34 FR 18858, Nov. 26, 1969]

**§ 1.196 Decision by the Board of Patent Appeals and Interferences.**

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner or remand the application to the examiner for further consideration. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any pending claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement constitutes a new ground of rejection of the claim. A new ground of rejection shall not be considered final for purposes of judicial review. When the

Board of Patent Appeals and Interferences makes a new ground of rejection, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. The new ground of rejection is binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground of rejection stated in the decision. Should the examiner reject the claims, appellant may again appeal pursuant to §§ 1.191 through 1.195 to the Board of Patent Appeals and Interferences.

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for rehearing must address the new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which rehearing is sought. Where request for such rehearing is made, the Board of Patent Appeals and Interferences shall rehear the new ground of rejection and, if necessary, render a new decision which shall include all grounds of rejection upon which a patent is refused. The decision on rehearing is deemed to incorporate the earlier decision for purposes of appeal, except for those portions specifically withdrawn on rehearing, and is final for the purpose of judicial review, except when noted otherwise in the decision.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, appellant shall have the right to

action indicates that it is made final (§ 1.113) or an appeal (§ 1.191) has been taken (§ 1.116), or in an *inter partes* reexamination, that it is an action closing prosecution (§ 1.949) or a right of appeal notice (§ 1.953).

[65 FR 76773, Dec. 7, 2000]

#### § 1.113 Final rejection or action.

(a) On the second or any subsequent examination or consideration by the examiner the rejection or other action may be made final, whereupon applicant's, or for *ex parte* reexaminations filed under § 1.510, patent owner's reply is limited to appeal in the case of rejection of any claim (§ 1.191), or to amendment as specified in § 1.114 or § 1.116. Petition may be taken to the Commissioner in the case of objections or requirements not involved in the rejection of any claim (§ 1.181). Reply to a final rejection or action must comply with § 1.114 or paragraph (c) of this section. For final actions in an *inter partes* reexamination filed under § 1.913, see § 1.953.

(b) In making such final rejection, the examiner shall repeat or state all grounds of rejection then considered applicable to the claims in the application, clearly stating the reasons in support thereof.

(c) Reply to a final rejection or action must include cancellation of, or appeal from the rejection of, each rejected claim. If any claim stands allowed, the reply to a final rejection or action must comply with any requirements or objections as to form.

[65 FR 14872, Mar. 20, 2000, as amended at 65 FR 76773, Dec. 7, 2000]

#### § 1.114 Request for continued examination.

(a) If prosecution in an application is closed, an applicant may request continued examination of the application by filing a submission and the fee set forth in § 1.17(e) prior to the earliest of:

- (1) Payment of the issue fee, unless a petition under § 1.313 is granted;
- (2) Abandonment of the application; or
- (3) The filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. 141, or the commencement of a civil action under

35 U.S.C. 145 or 146, unless the appeal or civil action is terminated.

(b) Prosecution in an application is closed as used in this section means that the application is under appeal, or that the last Office action is a final action (§ 1.113), a notice of allowance (§ 1.311), or an action that otherwise closes prosecution in the application.

(c) A submission as used in this section includes, but is not limited to, an information disclosure statement, an amendment to the written description, claims, or drawings, new arguments, or new evidence in support of patentability. If reply to an Office action under 35 U.S.C. 132 is outstanding, the submission must meet the reply requirements of § 1.111.

(d) If an applicant timely files a submission and fee set forth in § 1.17(e), the Office will withdraw the finality of any Office action and the submission will be entered and considered. If an applicant files a request for continued examination under this section after appeal, but prior to a decision on the appeal, it will be treated as a request to withdraw the appeal and to reopen prosecution of the application before the examiner. An appeal brief under § 1.192 or a reply brief under § 1.193(b), or related papers, will not be considered a submission under this section.

(e) The provisions of this section do not apply to:

- (1) A provisional application;
- (2) An application for a utility or plant patent filed under 35 U.S.C. 111(a) before June 8, 1995;
- (3) An international application filed under 35 U.S.C. 363 before June 8, 1995;
- (4) An application for a design patent; or
- (5) A patent under reexamination.

[65 FR 50104, Aug. 16, 2000]

#### AMENDMENTS

AUTHORITY: Secs. 1.115 to 1.127 also issued under 35 U.S.C. 132.

#### § 1.115 Preliminary amendments.

(a) A preliminary amendment is an amendment that is received in the Office (§ 1.6) on or before the mail date of the first Office action under § 1.104.

(b)(1) A preliminary amendment will be entered unless disapproved by the

of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, but should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement.

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph >by providing clear warning to others as to what constitutes infringement of the patent<. See, e.g., *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 USPQ2d 1279, 1283 (Fed. Cir. 2000). See also *In re Larsen*, No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished) (The preamble of the *Larsen* claim recited only a hanger and a loop but the body of the claim positively recited a linear member. The court observed that the totality of all the limitations of the claim and their interaction with each other must be considered to ascertain the inventor's contribution to the art. Upon review of the claim in its entirety, the court concluded that the claim at issue apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112 paragraph 2.).

>If the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. 112, second paragraph would be appropriate. See *Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470, 28 USPQ2d 1190, 1195 (Fed.

Cir. 1993). However, if the language used by applicant satisfies the statutory requirements of 35 U.S.C. 112, second paragraph, but the examiner merely wants the applicant to improve the clarity or precision of the language used, the claim must not be rejected under 35 U.S.C. 112, second paragraph, rather, the examiner should suggest improved language to the applicant.

For example, a claim recites "a suitable liquid such as the filtrate of the contaminated liquid to be filtered and solids of a filtering agent such as perlite, cellulose powder, etc." The mere use of the phrase "such as" in the claim does not by itself render the claim indefinite. Office policy is not to employ per se rules to make technical rejections. Examples of claim language which have been held to be indefinite set forth in MPEP § 2173.05(d) are fact specific and should not be applied as per se rules. The test for definiteness under 35 U.S.C. 112, second paragraph is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). If one skilled in the art is able to ascertain in the example above, the meaning of the terms "suitable liquid" and "solids of a filtering agent" in light of the specification, 35 U.S.C. 112, second paragraph is satisfied. If upon review of the claim as a whole in light of the specification, the examiner determines that a rejection under 35 U.S.C. 112, second paragraph is not appropriate in the above-noted example, but is of the opinion that the clarity and the precision of the language can be improved by the deletion of the phrase "such as" in the claim, the examiner may make such a suggestion to the applicant. If applicant does not accept the examiner's suggestion, the examiner should not pursue the issue.

If upon review of a claim in its entirety, the examiner concludes that a rejection under 35 U.S.C. 112, second paragraph is appropriate, such a rejection should be made and an analysis as to why the phrase(s) used in the claim is "vague and indefinite" should be included in the Office action. If applicants traverse the rejection, with or without the submission of an amendment, and the examiner considers applicant's arguments to be persuasive, the examiner should indicate in the next Office communication that the previous rejection under 35 U.S.C. 112, second



535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944, 70 USLW 4458, 62 U.S.P.Q.2d 1705, 02 Cal. Daily Op. Serv. 4539, 2002 Daily Journal D.A.R. 5803, 15 Fla. L. Weekly Fed. S 320

**Briefs and Other Related Documents**

**EXHIBIT 4**

**12 PAGES**

Supreme Court of the United States  
FESTO CORPORATION, Petitioner,

v.

SHOKETSU KINZOKU KOGYO KABUSHIKI CO., LTD., et al.

No. 00-1543.

Argued Jan. 8, 2002.

Decided May 28, 2002.

Holder of two patents relating to magnetic rodless cylinders sued competitor for infringement. The United States District Court for the District of Massachusetts, Patti B. Saris, J., held for plaintiff, and competitor appealed. The Court of Appeals, 72 F.3d 857, affirmed. On grant of writ of certiorari, the Supreme Court, 520 U.S. 1111, 117 S.Ct. 1240, 137 L.Ed.2d 323, vacated and remanded. On remand, the Court of Appeals initially affirmed in part, vacated in part, and remanded, 172 F.3d 1361, but on rehearing en banc, 187 F.3d 1381, reversed. Certiorari was granted. The Supreme Court, Justice Kennedy, held that: (1) prosecution history estoppel may apply to any claim amendment made to satisfy Patent Act's requirements; (2) amendment is not absolute bar to claim of infringement under doctrine of equivalents; and (3) patentee has burden of proving that amendment did not surrender particular equivalent in question.

Vacated and remanded.

**West Headnotes**

**[1] KeyCite this headnote**

- ↳ 291 Patents
  - ↳ 291X Title, Conveyances, and Contracts
    - ↳ 291X(A) Rights of Patentees in General
      - ↳ 291k184 Exclusive Nature of Right
        - ↳ 291k185 k. In General. Most Cited Cases

Patent holder's temporary monopoly is property right.

**[2] KeyCite this headnote**

- ↳ 291 Patents
  - ↳ 291XII Infringement
    - ↳ 291XII(A) What Constitutes Infringement
      - ↳ 291k233 Patents for Machines or Manufactures
        - ↳ 291k237 k. Substitution of Equivalents. Most Cited Cases

Scope of patent is not limited to its literal terms but instead embraces all equivalents to claims described.

**[3] KeyCite this headnote**

- ↳ 291 Patents
  - ↳ 291IX Construction and Operation of Letters Patent
    - ↳ 291IX(B) Limitation of Claims
      - ↳ 291k168 Proceedings in Patent Office in General
        - ↳ 291k168(2) Rejection and Amendment of Claims
          - ↳ 291k168(2.1) k. In General. Most Cited Cases

Prosecution history estoppel requires that claims of patent be interpreted in light of proceedings in patent Office during application process.

**[4] KeyCite this headnote**

- ↳ 291 Patents
  - ↳ 291IX Construction and Operation of Letters Patent

- ↪ 291IX(B) Limitation of Claims
- ↪ 291k168 Proceedings in Patent Office in General
- ↪ 291k168(2) Rejection and Amendment of Claims
- ↪ 291k168(2.1) k. In General. Most Cited Cases

When patentee originally claimed subject matter alleged to infringe but then narrowed claim in response to patent examiner's rejection, he may not argue that surrendered territory comprised unforeseen subject matter that should be deemed equivalent to literal claims of issued patent.

[5] KeyCite this headnote

- ↪ 291 Patents
- ↪ 291IX Construction and Operation of Letters Patent
- ↪ 291IX(B) Limitation of Claims
- ↪ 291k168 Proceedings in Patent Office in General
- ↪ 291k168(2) Rejection and Amendment of Claims
- ↪ 291k168(2.1) k. In General. Most Cited Cases

Prosecution history estoppel may apply to any claim amendment made to satisfy Patent Act's requirements, not just to amendments made to avoid prior art. 35 U.S.C.A. §§ 101-103, 112.

[6] KeyCite this headnote

- ↪ 291 Patents
- ↪ 291IX Construction and Operation of Letters Patent
- ↪ 291IX(B) Limitation of Claims
- ↪ 291k168 Proceedings in Patent Office in General
- ↪ 291k168(2) Rejection and Amendment of Claims
- ↪ 291k168(2.1) k. In General. Most Cited Cases
- ↪ 291 Patents KeyCite this headnote
- ↪ 291XII Infringement
- ↪ 291XII(A) What Constitutes Infringement
- ↪ 291k233 Patents for Machines or Manufactures
- ↪ 291k237 k. Substitution of Equivalents. Most Cited Cases

Amendment to patent application is not absolute bar to subsequent claim of infringement under doctrine of equivalents.

[7] KeyCite this headnote

- ↪ 291 Patents
- ↪ 291IX Construction and Operation of Letters Patent
- ↪ 291IX(B) Limitation of Claims
- ↪ 291k168 Proceedings in Patent Office in General
- ↪ 291k168(2) Rejection and Amendment of Claims
- ↪ 291k168(2.1) k. In General. Most Cited Cases
- ↪ 291 Patents KeyCite this headnote
- ↪ 291XII Infringement
- ↪ 291XII(A) What Constitutes Infringement
- ↪ 291k233 Patents for Machines or Manufactures
- ↪ 291k237 k. Substitution of Equivalents. Most Cited Cases

Patent applicant's narrowing amendment of claim in response to examiner objection is concession that patent does not extend as far as original claim, but not that amended claim is so perfect in its description that no one could devise equivalent.

[8] KeyCite this headnote

- ↪ 291 Patents



- ↪ 291IX Construction and Operation of Letters Patent
- ↪ 291IX(B) Limitation of Claims
- ↪ 291k168 Proceedings in Patent Office in General
- ↪ 291k168(2) Rejection and Amendment of Claims
- ↪ 291k168(2.1) k. In General. Most Cited Cases

- ↪ 291 Patents KeyCite this headnote
- ↪ 291XII Infringement
- ↪ 291XII(A) What Constitutes Infringement
- ↪ 291k233 Patents for Machines or Manufactures
- ↪ 291k237 k. Substitution of Equivalents. Most Cited Cases

Whether amendment of patent claim in response to examiner objection bars subsequent infringement claim based on doctrine of equivalents requires examination of nature of subject matter surrendered by narrowing amendment.

[9] KeyCite this headnote

- ↪ 291 Patents
- ↪ 291XII Infringement
- ↪ 291XII(C) Suits in Equity
- ↪ 291k312 Evidence
- ↪ 291k312(1) Presumptions and Burden of Proof
- ↪ 291k312(1.1) k. In General. Most Cited Cases

✓ Patentee alleging infringement under doctrine of equivalents has burden of proving that narrowing amendment made during patent prosecution did not surrender particular equivalent in question.

[10] KeyCite this headnote

- ↪ 291 Patents
- ↪ 291XII Infringement
- ↪ 291XII(C) Suits in Equity
- ↪ 291k312 Evidence
- ↪ 291k312(1) Presumptions and Burden of Proof
- ↪ 291k312(1.1) k. In General. Most Cited Cases

Patent applicant's decision to narrow his claims through amendment may be presumed to be general disclaimer of territory between original claim and amended claim.

[11] KeyCite this headnote

- ↪ 291 Patents
- ↪ 291XII Infringement
- ↪ 291XII(C) Suits in Equity
- ↪ 291k312 Evidence
- ↪ 291k312(1) Presumptions and Burden of Proof
- ↪ 291k312(1.1) k. In General. Most Cited Cases

Patentee alleging infringement under doctrine of equivalents can rebut presumption that prosecution history estoppel bars finding of equivalence by showing that at time of amendment one skilled in art could not reasonably be expected to have drafted claim that would have literally encompassed alleged equivalent.

**\*\*1832 \*722 Syllabus [FN\*]**

FN\* The syllabus constitutes no part of the opinion of the Court but has been prepared by the Reporter of Decisions for the convenience of the reader. See *United States v. Detroit Timber & Lumber Co.*, 200 U.S. 321, 337, 26 S.Ct. 282, 50 L.Ed. 499.

Petitioner Festo Corporation owns two patents for an industrial device. When the patent examiner rejected the initial

application for the first patent because of defects in description, 35 U.S.C. § 112, the application was amended to add the new limitations that the device would contain a pair of one-way sealing rings and that its outer sleeve would be made of a magnetizable material. The second patent was also amended during a reexamination proceeding to add the sealing rings limitation. After Festo began selling its device, respondents (hereinafter SMC) entered the market with a similar device that uses one two-way sealing ring and a nonmagnetizable sleeve. Festo filed suit, claiming that SMC's device is so similar that it infringes Festo's patents under the doctrine of equivalents. The District Court ruled for Festo, rejecting SMC's argument that the prosecution history estopped Festo from saying that SMC's device is equivalent. A Federal Circuit panel initially affirmed, but this Court granted certiorari, vacated, and remanded in light of *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 29, 117 S.Ct. 1040, 137 L.Ed.2d 146, which had acknowledged that competitors may rely on the prosecution history to estop the patentee from recapturing subject matter surrendered by amendment as a condition of obtaining the patent. On remand, the en banc Federal Circuit reversed, holding that prosecution history estoppel applied. The court ruled that estoppel arises from any amendment that narrows a claim to comply with the Patent Act, not only from amendments made to avoid the prior art, as the District Court had held. The Federal Circuit also held that, when estoppel applies, it bars any claim of equivalence for the element that was amended. The court acknowledged that, under its prior cases, prosecution history estoppel constituted a flexible bar, foreclosing some, but not all, claims of equivalence, depending on the purpose of the amendment and the alterations in the text. However, the court overruled its precedents on the ground that their case-by-case approach had proved unworkable.

**\*\*1833 Held:** Prosecution history estoppel may apply to any claim amendment made to satisfy the Patent Act's requirements, not just to amendments made to avoid the prior art, but estoppel need not bar suit against every equivalent to the amended claim element. Pp. 1837-1843.

**\*723 a)** To enable a patent holder to know what he owns, and the public to know what he does not, the inventor must describe his work in "full, clear, concise, and exact terms." § 112. However, patent claim language may not describe with complete precision the range of an invention's novelty. If patents were always interpreted by their literal terms, their value would be greatly diminished. Insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. Thus, a patent's scope is not limited to its literal terms, but embraces all equivalents to the claims described. See *Winans v. Denmead*, 56 U.S. (15 How.) 330, 347, 14 L.Ed. 717. Nevertheless, because it may be difficult to determine what is, or is not, an equivalent, competitors may be deterred from engaging in legitimate manufactures outside the patent's limits, or lulled into developing competing products that the patent secures, thereby prompting wasteful litigation. Each time the Court has considered the doctrine of equivalents, it has acknowledged this uncertainty as the price of ensuring the appropriate incentives for innovation, and it has affirmed the doctrine over dissents that urged a more certain rule. See, e.g., *id.*, at 343, 347. Most recently, *Warner-Jenkinson*, *supra*, at 28, 117 S.Ct. 1040, reaffirmed the doctrine. Pp. 1837-1838. **(b)** Prosecution history estoppel requires that patent claims be interpreted in light of the proceedings before the Patent and Trademark Office (PTO). When the patentee originally claimed the subject matter alleged to infringe but then narrowed the claim in response to a rejection, he may not argue that the surrendered territory comprised an unforeseen equivalent. See *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 136-137, 62 S.Ct. 513, 86 L.Ed. 736. The rejection indicates that the patent examiner does not believe the original claim could be patented. While the patentee has the right to appeal, his decision to forgo an appeal and submit an amended claim is taken as a concession that the invention as patented does not reach as far as the original claim. See, e.g., *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 228, 26 L.Ed. 149. Were it otherwise, the inventor might avoid the PTO's gatekeeping role and seek to recapture in an infringement action the very subject matter surrendered as a condition of receiving the patent. Pp. 1838- 1839.

**(c)** Prosecution history estoppel is not limited to amendments intended to narrow the patented invention's subject matter, e.g., to avoid prior art, but may apply to a narrowing amendment made to satisfy any Patent Act requirement, including § 112's requirements concerning the patent application's form. In *Warner-Jenkinson*, the Court made clear that estoppel applies to amendments made for a "substantial reason related to patentability," 520 U.S., at 33, 117 S.Ct. 1040, but did not purport to catalog every reason that might raise an estoppel. Indeed, it stated that even **\*724** if the amendment's purpose were unrelated to patentability, the court might consider whether it was the kind of reason that nonetheless might require estoppel. *Id.*, at 40-41, 117 S.Ct. 1040. Simply because estoppel has been discussed most often in the context of amendments made to avoid the prior art, see, e.g., *id.*, at 30, 117 S.Ct. 1040, it does not follow that amendments made for other purposes will not give rise to estoppel. Section 112 requires that the application describe, enable, and set forth the best mode of carrying out the invention. The patent should not issue if these requirements are not satisfied, and an applicant's failure to meet them could lead to the issued patent being held invalid in later litigation. Festo's argument that **\*\*1834** amendments made to comply with § 112 concern the application's form and not the invention's subject matter conflates the patentee's reason for making the amendment with the impact the amendment has on the subject matter. Estoppel arises when an amendment is made to secure the patent and the amendment narrows the patent's scope. If a § 112 amendment is truly cosmetic, it would not narrow the patent's scope or raise an estoppel. But if a § 112 amendment is necessary and narrows the patent's scope—even if only for better description—estoppel may apply. Pp. 1839-1840.

**(d)** Prosecution history estoppel does not bar the inventor from asserting infringement against every equivalent to the narrowed element. Though estoppel can bar challenges to a wide range of equivalents, its reach requires an examination of the subject matter surrendered by the narrowing amendment. The Federal Circuit's complete bar rule

is inconsistent with the purpose of applying the estoppel in the first place--to hold the inventor to the representations made during the application process and the inferences that may be reasonably drawn from the amendment. By amending the application, the inventor is deemed to concede that the patent does not extend as far as the original claim, not that the amended claim is so perfect in its description that no one could devise an equivalent. The Court's view is consistent with precedent and PTO practice. The Court has consistently applied the doctrine in a flexible way, considering what equivalents were surrendered during a patent's prosecution, rather than imposing a complete bar that resorts to the very literalism the equivalents rule is designed to overcome. *E.g.*, *Goodyear Dental, supra*, at 230, 12 Otto 222, 26 L.Ed. 149. The Federal Circuit ignored *Warner-Jenkinson's* instruction that courts must be cautious before adopting changes that disrupt the settled expectations of the inventing community. See 520 U.S., at 28, 117 S.Ct. 1040. Inventors who amended their claims under the previous case law had no reason to believe they were conceding all equivalents. Had they known, they might have appealed the rejection instead. *Warner-Jenkinson* struck the appropriate balance by placing the burden on the patentee to prove that an amendment was not made for a reason that would give rise to estoppel. *Id.*, at 33, 117 S.Ct. 1040. Similarly, the patentee should bear the burden of showing that the amendment does not surrender the particular equivalent in question. As the author of the claim language, his decision to narrow his claims through amendment may be presumed to be a general disclaimer of the territory between the original claim and the amended claim. *Exhibit Supply, supra*, at 136-137, 62 S.Ct. 513. However, in cases in which the amendment cannot reasonably be viewed as surrendering a particular equivalent--*e.g.*, where the equivalent was unforeseeable at the time of the application or the rationale underlying the amendment bears but a tangential relation to the equivalent--the patentee can rebut the presumption that prosecution history estoppel bars a finding of equivalence by showing that at the time of the amendment one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent. Pp. 1840-1842.

(e) Whether Festo has rebutted the presumptions that estoppel applies and that the equivalents at issue have been surrendered should be determined in the first instance by further proceedings below. Pp. 1842-1843.

234 F.3d 558, vacated and remanded.

KENNEDY, J., delivered the opinion for a unanimous Court.

Robert H. Bork, Washington, DC, for the petitioner.

Lawrence G. Wallace, Washington, DC, for the United States as amicus curiae, by special leave of the Court, supporting vacatur and remand.

**\*\*1835** Arthur I. Neustadt, Arlington, VA, for the respondents.

**\*726** Justice KENNEDY delivered the opinion of the Court.

This case requires us to address once again the relation between two patent law concepts, the doctrine of equivalents and the rule of prosecution history estoppel. The Court considered the same concepts in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997), and reaffirmed

**\*727** that a patent protects its holder against efforts of copyists to evade liability for infringement by making only insubstantial changes to a patented invention. At the same time, we appreciated that by extending protection beyond the literal terms in a patent the doctrine of equivalents can create substantial uncertainty about where the patent monopoly ends. *Id.*, at 29, 117 S.Ct. 1040. If the range of equivalents is unclear, competitors may be unable to determine what is a permitted alternative to a patented invention and what is an infringing equivalent.

To reduce the uncertainty, *Warner-Jenkinson* acknowledged that competitors may rely on the prosecution history, the public record of the patent proceedings. In some cases the Patent and Trademark Office (PTO) may have rejected an earlier version of the patent application on the ground that a claim does not meet a statutory requirement for patentability. 35 U.S.C. § 132 (1994 ed., Supp. V). When the patentee responds to the rejection by narrowing his claims, this prosecution history estops him from later arguing that the subject matter covered by the original, broader claim was nothing more than an equivalent. Competitors may rely on the estoppel to ensure that their own devices will not be found to infringe by equivalence.

In the decision now under review the Court of Appeals for the Federal Circuit held that by narrowing a claim to obtain a patent, the patentee surrenders all equivalents to the amended claim element. Petitioner asserts this holding departs from past precedent in two respects. First, it applies estoppel to every amendment made to satisfy the requirements of the Patent Act and not just to amendments made to avoid pre-emption by an earlier invention, *i.e.*, the prior art. Second, it holds that when estoppel arises, it bars suit against every equivalent to the amended claim element. The Court of Appeals acknowledged that this holding departed from its own cases, which applied a flexible bar when considering what claims of equivalence were estopped by the **\*728** prosecution history. Petitioner argues that by replacing the flexible bar with a complete bar the Court of Appeals cast doubt on many existing patents that were amended during the application process when the law, as it then stood, did not apply so rigorous a standard. We granted certiorari to consider these questions.

Petitioner Festo Corporation owns two patents for an improved magnetic rodless cylinder, a piston-driven device that relies on magnets to move objects in a conveying system. The device has many industrial uses and has been employed in machinery as diverse as sewing equipment and the Thunder Mountain ride at Disney World. Although the precise details of the cylinder's operation are not essential here, the prosecution history must be considered.

Petitioner's patent applications, as often occurs, were amended during the prosecution proceedings. The application for the first patent, the Stoll Patent (U.S. Patent No. 4,354,125), was amended after the patent examiner rejected the initial application because the exact method of operation was unclear and some claims were made in **\*\*1836** an impermissible way. (They were multiply dependent.) 35 U.S.C. § 112 (1994 ed.). The inventor, Dr. Stoll, submitted a new application designed to meet the examiner's objections and also added certain references to prior art. 37 CFR § 1.56 (2000). The second patent, the Carroll Patent (U.S. Patent No. 3,779,401), was also amended during a reexamination proceeding. The prior art references were added to this amended application as well. Both amended patents added a new limitation--that the inventions contain a pair of sealing rings, each having a lip on one side, which would prevent impurities from getting on the piston assembly. The amended Stoll Patent added the further limitation that the outer shell of the device, the sleeve, be made of a magnetizable material.

**\*729** After Festo began selling its rodless cylinder, respondents (whom we refer to as SMC) entered the market with a device similar, but not identical, to the ones disclosed by Festo's patents. SMC's cylinder, rather than using two one-way sealing rings, employs a single sealing ring with a two-way lip. Furthermore, SMC's sleeve is made of a nonmagnetizable alloy. SMC's device does not fall within the literal claims of either patent, but petitioner contends that it is so similar that it infringes under the doctrine of equivalents.

SMC contends that Festo is estopped from making this argument because of the prosecution history of its patents. The sealing rings and the magnetized alloy in the Festo product were both disclosed for the first time in the amended applications. In SMC's view, these amendments narrowed the earlier applications, surrendering alternatives that are the very points of difference in the competing devices--the sealing rings and the type of alloy used to make the sleeve. As Festo narrowed its claims in these ways in order to obtain the patents, says SMC, Festo is now estopped from saying that these features are immaterial and that SMC's device is an equivalent of its own.

The United States District Court for the District of Massachusetts disagreed. It held that Festo's amendments were not made to avoid prior art, and therefore the amendments were not the kind that give rise to estoppel. A panel of the Court of Appeals for the Federal Circuit affirmed. 72 F.3d 857 (1995). We granted certiorari, vacated, and remanded in light of our intervening decision in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). After a decision by the original panel on remand, 172 F.3d 1361 (1999), the Court of Appeals ordered rehearing en banc to address questions that had divided its judges since our decision in *Warner-Jenkinson*. 187 F.3d 1381 (1999).

The en banc court reversed, holding that prosecution history estoppel barred Festo from asserting that the accused device infringed its patents under the doctrine of equivalents. **\*730** 234 F.3d 558 (2000). The court held, with only one judge dissenting, that estoppel arises from any amendment that narrows a claim to comply with the Patent Act, not only from amendments made to avoid prior art. *Id.*, at 566. More controversial in the Court of Appeals was its further holding: When estoppel applies, it stands as a complete bar against any claim of equivalence for the element that was amended. *Id.*, at 574-575. The court acknowledged that its own prior case law did not go so far. Previous decisions had held that prosecution history estoppel constituted a flexible bar, foreclosing some, but not all, claims of equivalence, depending on the purpose of the amendment and the alterations in the text. The court concluded, however, that its precedents applying the flexible-bar rule should be overruled because this case-by-case approach has proved unworkable. In the court's view a complete-bar rule, under which estoppel bars all claims of equivalence to the narrowed element, would promote certainty in the determination of infringement cases.

**\*\*1837** Four judges dissented from the decision to adopt a complete bar. *Id.*, at 562. In four separate opinions, the dissenters argued that the majority's decision to overrule precedent was contrary to *Warner-Jenkinson* and would unsettle the expectations of many existing patentees. Judge Michel, in his dissent, described in detail how the complete bar required the Court of Appeals to disregard 8 older decisions of this Court, as well as more than 50 of its own cases. 234 F.3d, at 601-616.

We granted certiorari. 533 U.S. 915, 121 S.Ct. 2519, 150 L.Ed.2d 692 (2001).

## II

[1] The patent laws "promote the Progress of Science and useful Arts" by rewarding innovation with a temporary monopoly. U.S. Const., Art. I, § 8, cl. 8. The monopoly is a property right; and like any property right, its boundaries should be clear. This clarity is essential to promote progress, because **\*731** it enables efficient investment in innovation. A patent holder should know what he owns, and the public should know what he does not. For this reason, the patent laws require inventors to describe their work in "full, clear, concise, and exact terms," 35 U.S.C. § 112, as part of the delicate balance the law attempts to maintain between inventors, who rely on the promise of the law to bring the invention forth, and the public, which should be encouraged to pursue innovations, creations, and new ideas beyond the inventor's exclusive rights. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150, 109 S.Ct. 971, 103 L.Ed.2d 118 (1989).

[2] Unfortunately, the nature of language makes it impossible to capture the essence of a thing in a patent application. The inventor who chooses to patent an invention and disclose it to the public, rather than exploit it in secret, bears the risk that others will devote their efforts toward exploiting the limits of the patent's language: "An invention exists most importantly as a tangible structure or a series of drawings. A verbal portrayal is usually an afterthought written to satisfy the requirements of patent law. This conversion of machine to words allows for unintended idea gaps which cannot be satisfactorily filled. Often the invention is novel and words do not exist to describe it. The dictionary does not always keep abreast of the inventor. It cannot. Things are not made for the sake of words, but words for things." *Autogiro Co. of America v. United States*, 181 Ct.Cl. 55, 384 F.2d 391, 397 (1967).

The language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty. If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. For this **\*732** reason, the clearest rule of patent interpretation, literalism, may conserve judicial resources but is not necessarily the most efficient rule. The scope of a patent is not limited to its literal terms but instead embraces all equivalents to the claims described. See *Winans v. Denmead*, 56 U.S. (15 How.) 330, 347, 14 L.Ed. 717 (1854).

It is true that the doctrine of equivalents renders the scope of patents less certain. It may be difficult to determine what is, or is not, an equivalent to a particular element of an invention. If competitors cannot be certain about a patent's extent, they may be deterred from engaging in legitimate manufactures outside its limits, or they may invest by mistake in competing products that the patent secures. In addition the uncertainty may lead to wasteful litigation between competitors, suits that a rule of literalism might avoid. These concerns with the doctrine of equivalents, however, are not new. Each time the **\*\*1838** Court has considered the doctrine, it has acknowledged this uncertainty as the price of ensuring the appropriate incentives for innovation, and it has affirmed the doctrine over dissents that urged a more certain rule. When the Court in *Winans v. Denmead*, *supra*, first adopted what has become the doctrine of equivalents, it stated that "[t]he exclusive right to the thing patented is not secured, if the public are at liberty to make substantial copies of it, varying its form or proportions." *Id.*, at 343. The dissent argued that the Court had sacrificed the objective of "[f]ul[l]ness, clearness, exactness, preciseness, and particularity, in the description of the invention." *Id.*, at 347 (opinion of Campbell, J.).

The debate continued in *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097 (1950), where the Court reaffirmed the doctrine. *Graver Tank* held that patent claims must protect the inventor not only from those who produce devices falling within the literal claims of the patent but also from copyists who "make unimportant and insubstantial changes and substitutions in the patent which, though adding **\*733** nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law." *Id.*, at 607, 70 S.Ct. 854. Justice Black, in dissent, objected that under the doctrine of equivalents a competitor "cannot rely on what the language of a patent claims. He must be able, at the peril of heavy infringement damages, to forecast how far a court relatively unversed in a particular technological field will expand the claim's language ...." *Id.*, at 617, 70 S.Ct. 854.

Most recently, in *Warner-Jenkinson*, the Court reaffirmed that equivalents remain a firmly entrenched part of the settled rights protected by the patent. A unanimous opinion concluded that if the doctrine is to be discarded, it is Congress and not the Court that should do so:

"[T]he lengthy history of the doctrine of equivalents strongly supports adherence to our refusal in *Graver Tank* to find that the Patent Act conflicts with that doctrine. Congress can legislate the doctrine of equivalents out of existence any time it chooses. The various policy arguments now made by both sides are thus best addressed to Congress, not this Court." 520 U.S., at 28, 117 S.Ct. 1040.

### III

[3][4] Prosecution history estoppel requires that the claims of a patent be interpreted in light of the proceedings in the PTO during the application process. Estoppel is a "rule of patent construction" that ensures that claims are interpreted by reference to those "that have been cancelled or rejected." *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 220-221, 61 S.Ct. 235, 85 L.Ed. 132 (1940). The doctrine of equivalents allows the patentee to claim those insubstantial alterations that were not captured in drafting the original patent claim but which could be created through trivial changes. When, however, the patentee originally claimed the subject matter alleged to infringe but then narrowed the claim in response to a rejection, he may not argue that the surrendered territory comprised **\*734** unforeseen subject matter that should be deemed equivalent to the literal claims of the issued patent. On the contrary, "[b]y the amendment [the patentee] recognized and emphasized the difference between the two phrases [...] ... and [t]he difference which [the patentee] thus disclaimed must be regarded as material." *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 136-137, 62 S.Ct. 513, 86 L.Ed. 736 (1942).

A rejection indicates that the patent examiner does not believe the original claim could be patented. While the patentee has the right to appeal, his decision to forgo an appeal and submit an amended claim is taken as a concession that the invention as patented does not reach as far as the original claim. See **\*\*1839** *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 228, 26 L.Ed. 149 (1880) ("In view of [the amendment] there can be no doubt of what [the patentee] understood he had patented, and that both he and the commissioner regarded the patent to be for a manufacture made exclusively of vulcanites by the detailed process"); *Wang Laboratories, Inc. v. Mitsubishi Electronics America, Inc.*, 103 F.3d 1571, 1577-1578 (C.A.Fed.1997) ("Prosecution history estoppel ... preclud[es] a patentee from regaining, through litigation, coverage of subject matter relinquished during prosecution of the application for the patent"). Were it otherwise, the inventor might avoid the PTO's gatekeeping role and seek to recapture in an infringement action the very subject matter surrendered as a condition of receiving the patent. Prosecution history estoppel ensures that the doctrine of equivalents remains tied to its underlying purpose. Where the original application once embraced the purported equivalent but the patentee narrowed his claims to obtain the patent or to protect its validity, the patentee cannot assert that he lacked the words to describe the subject matter in question. The doctrine of equivalents is premised on language's inability to capture the essence of innovation, but a prior application describing the precise element at issue undercuts that premise. In that instance the prosecution history has **\*735** established that the inventor turned his attention to the subject matter in question, knew the words

for both the broader and narrower claim, and affirmatively chose the latter.

#### A

The first question in this case concerns the kinds of amendments that may give rise to estoppel. Petitioner argues that estoppel should arise when amendments are intended to narrow the subject matter of the patented invention, for instance, amendments to avoid prior art, but not when the amendments are made to comply with requirements concerning the form of the patent application. In *Warner-Jenkinson* we recognized that prosecution history estoppel does not arise in every instance when a patent application is amended. Our "prior cases have consistently applied prosecution history estoppel only where claims have been amended for a limited set of reasons," such as "to avoid the prior art, or otherwise to address a specific concern--such as obviousness--that arguably would have rendered the claimed subject matter unpatentable." 520 U.S., at 30-32, 117 S.Ct. 1040. While we made clear that estoppel applies to amendments made for a "substantial reason related to patentability," *id.*, at 33, 117 S.Ct. 1040, we did not purport to define that term or to catalog every reason that might raise an estoppel. Indeed, we stated that even if the amendment's purpose were unrelated to patentability, the court might consider whether it was the kind of reason that nonetheless might require resort to the estoppel doctrine. *Id.*, at 40-41, 117 S.Ct. 1040.

Petitioner is correct that estoppel has been discussed most often in the context of amendments made to avoid the prior art. See *Exhibit Supply Co.*, *supra*, at 137, 62 S.Ct. 513; *Keystone Driller Co. v. Northwest Engineering Corp.*, 294 U.S. 42, 48, 55 S.Ct. 262, 79 L.Ed. 747 (1935). Amendment to accommodate prior art was the emphasis, too, of our decision in *Warner-Jenkinson*, *supra*, at 30, 117 S.Ct. 1040. It does not follow, however, that amendments for other purposes will not give rise to estoppel. Prosecution history may rebut the inference that a thing not described was indescribable. That rationale does not cease simply because the narrowing amendment, submitted to secure a patent, was for some purpose other than avoiding prior art.

[5] We agree with the Court of Appeals that a narrowing amendment made to satisfy any requirement of the Patent Act may give rise to an estoppel. As that court explained, a number of statutory requirements must be satisfied before a patent **\*\*1840** can issue. The claimed subject matter must be useful, novel, and not obvious. 35 U.S.C. §§ 101-103 (1994 ed. and Supp. V). In addition, the patent application must describe, enable, and set forth the best mode of carrying out the invention. § 112 (1994 ed.). These latter requirements must be satisfied before issuance of the patent, for exclusive patent rights are given in exchange for disclosing the invention to the public. See *Bonito Boats*, 489 U.S., at 150-151, 109 S.Ct. 971. What is claimed by the patent application must be the same as what is disclosed in the specification; otherwise the patent should not issue. The patent also should not issue if the other requirements of § 112 are not satisfied, and an applicant's failure to meet these requirements could lead to the issued patent being held invalid in later litigation.

Petitioner contends that amendments made to comply with § 112 concern the form of the application and not the subject matter of the invention. The PTO might require the applicant to clarify an ambiguous term, to improve the translation of a foreign word, or to rewrite a dependent claim as an independent one. In these cases, petitioner argues, the applicant has no intention of surrendering subject matter and should not be estopped from challenging equivalent devices. While this may be true in some cases, petitioner's argument conflates the patentee's reason for making the amendment with the impact the amendment has on the subject matter.

Estoppel arises when an amendment is made to secure the patent and the amendment narrows the patent's scope. If a § 112 amendment is truly cosmetic, then it would not narrow **\*737** the patent's scope or raise an estoppel. On the other hand, if a § 112 amendment is necessary and narrows the patent's scope--even if only for the purpose of better description--estoppel may apply. A patentee who narrows a claim as a condition for obtaining a patent disavows his claim to the broader subject matter, whether the amendment was made to avoid the prior art or to comply with § 112. We must regard the patentee as having conceded an inability to claim the broader subject matter or at least as having abandoned his right to appeal a rejection. In either case estoppel may apply.

#### B

[6] Petitioner concedes that the limitations at issue--the sealing rings and the composition of the sleeve--were made for reasons related to § 112, if not also to avoid the prior art. Our conclusion that prosecution history estoppel arises when a claim is narrowed to comply with § 112 gives rise to the second question presented: Does the estoppel bar the inventor from asserting infringement against any equivalent to the narrowed element or might some equivalents still infringe? The Court of Appeals held that prosecution history estoppel is a complete bar, and so the narrowed element must be limited to its strict literal terms. Based upon its experience the Court of Appeals decided that the flexible-bar rule is unworkable because it leads to excessive uncertainty and burdens legitimate innovation. For the reasons that follow, we disagree with the decision to adopt the complete bar.

[7][8] Though prosecution history estoppel can bar a patentee from challenging a wide range of alleged equivalents made or distributed by competitors, its reach requires an examination of the subject matter surrendered by the narrowing amendment. The complete bar avoids this inquiry by establishing a *per se* rule; but that approach is inconsistent with the purpose of applying the estoppel in the first place--to hold the inventor to the representations made during the application process and to the inferences that may reasonably **\*738** be drawn from the amendment. By amending the application, the inventor is deemed to concede that the patent does not extend as far as the original claim. It does not follow, however, **\*\*1841** that the amended claim becomes so perfect in its description that no one could devise an equivalent. After amendment, as before, language remains an imperfect fit for invention. The narrowing amendment may demonstrate what the claim is not; but it may still fail to capture precisely what the claim is. There is no reason why a narrowing amendment should be deemed to relinquish equivalents unforeseeable at the



time of the amendment and beyond a fair interpretation of what was surrendered. Nor is there any call to foreclose claims of equivalence for aspects of the invention that have only a peripheral relation to the reason the amendment was submitted. The amendment does not show that the inventor suddenly had more foresight in the drafting of claims than an inventor whose application was granted without amendments having been submitted. It shows only that he was familiar with the broader text and with the difference between the two. As a result, there is no more reason for holding the patentee to the literal terms of an amended claim than there is for abolishing the doctrine of equivalents altogether and holding every patentee to the literal terms of the patent.

This view of prosecution history estoppel is consistent with our precedents and respectful of the real practice before the PTO. While this Court has not weighed the merits of the complete bar against the flexible bar in its prior cases, we have consistently applied the doctrine in a flexible way, not a rigid one. We have considered what equivalents were surrendered during the prosecution of the patent, rather than imposing a complete bar that resorts to the very literalism the equivalents rule is designed to overcome. *E.g.*, *Goodyear Dental Vulcanite Co.*, 102 U.S., at 230, 26 L.Ed. 149; *Hurlbut v. Schillinger*, 130 U.S. 456, 465, 9 S.Ct. 584, 32 L.Ed. 1011 (1889).

**\*739** The Court of Appeals ignored the guidance of *Warner-Jenkinson*, which instructed that courts must be cautious before adopting changes that disrupt the settled expectations of the inventing community. See 520 U.S., at 28, 117 S.Ct. 1040. In that case we made it clear that the doctrine of equivalents and the rule of prosecution history estoppel are settled law. The responsibility for changing them rests with Congress. *Ibid.* Fundamental alterations in these rules risk destroying the legitimate expectations of inventors in their property. The petitioner in *Warner-Jenkinson* requested another bright-line rule that would have provided more certainty in determining when estoppel applies but at the cost of disrupting the expectations of countless existing patent holders. We rejected that approach: "To change so substantially the rules of the game now could very well subvert the various balances the PTO sought to strike when issuing the numerous patents which have not yet expired and which would be affected by our decision." *Id.*, at 32, n. 6, 117 S.Ct. 1040; see also *id.*, at 41, 117 S.Ct. 1040 (GINSBURG, J., concurring) ("The new presumption, if applied woodenly, might in some instances unfairly discount the expectations of a patentee who had no notice at the time of patent prosecution that such a presumption would apply"). As *Warner-Jenkinson* recognized, patent prosecution occurs in the light of our case law. Inventors who amended their claims under the previous regime had no reason to believe they were conceding all equivalents. If they had known, they might have appealed the rejection instead. There is no justification for applying a new and more robust estoppel to those who relied on prior doctrine.

In *Warner-Jenkinson* we struck the appropriate balance by placing the burden on the patentee to show that an amendment was not for purposes of patentability:

"Where no explanation is established, however, the court should presume that the patent application had a substantial reason related to patentability for including the limiting element added by amendment. In those **\*740** circumstances, prosecution history estoppel would bar the application of the doctrine of equivalents **\*\*1842** as to that element." *Id.*, at 33, 117 S.Ct. 1040.

When the patentee is unable to explain the reason for amendment, estoppel not only applies but also "bar[s] the application of the doctrine of equivalents as to that element." *Ibid.* These words do not mandate a complete bar; they are limited to the circumstance where "no explanation is established." They do provide, however, that when the court is unable to determine the purpose underlying a narrowing amendment--and hence a rationale for limiting the estoppel to the surrender of particular equivalents--the court should presume that the patentee surrendered all subject matter between the broader and the narrower language.

**[9][10][11]** Just as *Warner-Jenkinson* held that the patentee bears the burden of proving that an amendment was not made for a reason that would give rise to estoppel, we hold here that the patentee should bear the burden of showing that the amendment does not surrender the particular equivalent in question. This is the approach advocated by the United States, see Brief for United States as *Amicus Curiae* 22-28, and we regard it to be sound. The patentee, as the author of the claim language, may be expected to draft claims encompassing readily known equivalents. A patentee's decision to narrow his claims through amendment may be presumed to be a general disclaimer of the territory between the original claim and the amended claim. *Exhibit Supply*, 315 U.S., at 136-137, 62 S.Ct. 513 ("By the amendment [the patentee] recognized and emphasized the difference between the two phrases and proclaimed his abandonment of all that is embraced in that difference"). There are some cases, however, where the amendment cannot reasonably be viewed as surrendering a particular equivalent. The equivalent may have been unforeseeable at the time of the application; the rationale underlying the amendment may bear no more than a tangential relation to the equivalent in question; or there **\*741** may be some other reason suggesting that the patentee could not reasonably be expected to have described the insubstantial substitute in question. In those cases the patentee can overcome the presumption that prosecution history estoppel bars a finding of equivalence.

This presumption is not, then, just the complete bar by another name. Rather, it reflects the fact that the interpretation of the patent must begin with its literal claims, and the prosecution history is relevant to construing those claims. When the patentee has chosen to narrow a claim, courts may presume the amended text was composed with awareness of this rule and that the territory surrendered is not an equivalent of the territory claimed. In those instances, however, the patentee still might rebut the presumption that estoppel bars a claim of equivalence. The patentee must show that at the time of the amendment one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent.

## IV

On the record before us, we cannot say petitioner has rebutted the presumptions that estoppel applies and that the equivalents at issue have been surrendered. Petitioner concedes that the limitations at issue--the sealing rings and the composition of the sleeve--were made in response to a rejection for reasons under § 112, if not also because of the prior art references. As the amendments were made for a reason relating to patentability, the question is not whether estoppel applies but what territory the amendments surrendered. While estoppel does not effect a complete bar, the question remains whether petitioner can demonstrate that the narrowing amendments did not surrender the particular equivalents at issue. On these questions, SMC may well prevail, for the sealing rings and the composition of the sleeve both were noted expressly in the prosecution history. These matters, **\*\*1843** however, should be determined in the first instance **\*742** by further proceedings in the Court of Appeals or the District Court. The judgment of the Federal Circuit is vacated, and the case is remanded for further proceedings consistent with this opinion.

*It is so ordered.*

U.S., 2002.












Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.

535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944, 70 USLW 4458, 62 U.S.P.Q.2d 1705, 02 Cal. Daily Op. Serv. 4539, 2002 Daily Journal D.A.R. 5803, 15 Fla. L. Weekly Fed. S 320

#### Briefs and Other Related Documents [\(Back to top\)](#)

- 2002 WL 22010, 70 USLW 3462 (Oral Argument) Oral Argument (Jan. 08, 2002)
- 2001 WL 1548695 (Appellate Brief) REPLY BRIEF FOR PETITIONER (Nov. 30, 2001)
- 2001 WL 1397746 (Appellate Brief) BRIEF OF THE CONSUMER PROJECT ON TECHNOLOGY AS AMICUS CURIAE IN SUPPORT OF RESPONDENTS (Oct. 31, 2001)
- 2001 WL 1397747 (Appellate Brief) BRIEF OF INTERNATIONAL BUSINESS MACHINES CORPORATION, EASTMAN KODAK COMPANY, FORD MOTOR COMPANY, E.I. DU PONT DE NEMOURS AND COMPANY, AGERE SYSTEMS INCORPORATED AND THE FINANCIAL SERVICES ROUNDTABLE AS AMICI CURIAE IN SUPPORT OF RESPONDENTS (Oct. 31, 2001)
- 2001 WL 1480572 (Appellate Brief) Brief Amicus Curiae of Genentech, Inc. In Support of Respondents Seeking Affirmance (Oct. 31, 2001)
- 2001 WL 1548692 (Appellate Brief) BRIEF OF AMICI CURIAE APPLERA CORPORATION (APPLIED BIOSYSTEMS AND CELERA GENOMICS), APPLIED MATERIALS, INC., CISCO SYSTEMS, INC., MICRON TECHNOLOGY, INC., AND ORACLE CORPORATION IN SUPPORT OF RESPONDENTS (Oct. 31, 2001)
- 2001 WL 1548693 (Appellate Brief) BRIEF OF AMICUS CURIAE MEDIMMUNE, INC. IN SUPPORT OF RESPONDENTS (Oct. 31, 2001)
- 2001 WL 1576083 (Appellate Brief) Brief of Intel Corporation, Cypress Semiconductor Corporation and United Technologies Corporation As Amici Curiae in Support of Respondents (Oct. 31, 2001)
- 2001 WL 1880016 (Appellate Brief) BRIEF FOR RESPONDENTS (Oct. 31, 2001)
- 2001 WL 1002689 (Appellate Brief) BRIEF FOR LITTON SYSTEMS, INCORPORATED AS AMICUS CURIAE IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1024048 (Appellate Brief) BRIEF OF THE AMERICAN BAR ASSOCIATION AS AMICUS CURIAE IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025096 (Appellate Brief) BRIEF OF AMICUS CURIAE AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025099 (Appellate Brief) BRIEF OF AMICUS CURIAE ASTA MEDICA AKTIENGESELLSCHAFT IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025107 (Appellate Brief) BRIEF OF AMICUS CURIAE CELLTECH GROUP PLC. IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025109 (Appellate Brief) BRIEF OF AMICUS CURIAE CHIRON CORPORATION IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025114 (Appellate Brief) BRIEF OF AMICUS CURIAE FEDERAL CIRCUIT BAR ASSOCIATION IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025169 (Appellate Brief) BRIEF OF THE HOUSTON INTELLECTUAL PROPERTY LAW ASSOCIATION AS AMICUS CURIAE IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025252 (Appellate Brief) BRIEF OF AMICI CURIAE INTELLECTUAL PROPERTY CREATORS AND THE SOCIETY OF AMATEUR SCIENTISTS IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- 2001 WL 1025309 (Appellate Brief) BRIEF OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS -- UNITED STATES OF AMERICA AS AMICUS CURIAE IN SUPPORT OF NEITHER PARTY (Aug. 31, 2001)
- 2001 WL 1025380 (Appellate Brief) BRIEF OF MINNESOTA MINING AND MANUFACTURING COMPANY, ELI LILLY AND COMPANY, HENKEL CORPORATION, JOHNSON & JOHNSON, PFIZER INC., PPG INDUSTRIES, INC., REXAM BEVERAGE CAN COMPANY, SUN MICROSYSTEMS, INC., AND VERIZON COMMUNICATIONS INC., AS AMICI CURIAE IN SUPPORT OF PETITIONER (Aug. 31, 2001)



- [2001 WL 1025444](#) (Appellate Brief) BRIEF OF AMICUS CURIAE THE NATIONAL BAR ASSOCIATION IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- [2001 WL 1025514](#) (Appellate Brief) BRIEF OF AMICUS CURIAE NATIONAL INTELLECTUAL PROPERTY LAW INSTITUTE IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- [2001 WL 1025555](#) (Appellate Brief) Brief for Amicus Curiae in Support of Neither Party on Behalf of The Patent, Trademark, & Copyright Section of the Bar Association of the District of Columbia (Aug. 31, 2001)
- [2001 WL 1025603](#) (Appellate Brief) BRIEF OF AMICUS CURIAE PHILADELPHIA INTELLECTUAL PROPERTY LAW ASSOCIATION IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- [2001 WL 1025650](#) (Appellate Brief) BRIEF FOR THE UNITED STATES AS AMICUS CURIAE SUPPORTING VACATUR AND REMAND (Aug. 31, 2001)
- [2001 WL 1025738](#) (Appellate Brief) BRIEF FOR PETITIONER (Aug. 31, 2001)
- [2001 WL 1040335](#) (Appellate Brief) BRIEF FOR BOSE CORPORATION AS AMICUS CURIAE IN SUPPORT OF PETITIONER (Aug. 31, 2001)
- [2001 WL 1056915](#) (Appellate Brief) BRIEF OF AMICUS CURIAE IN SUPPORT OF REVERSAL OF THE JUDGMENT BELOW (Aug. 31, 2001)
- [2001 WL 34093999](#) (Joint Appendix) (Aug. 31, 2001)
- [2001 WL 1025117](#) (Appellate Brief) BRIEF OF AMICUS CURIAE FEDERATION INTERNATIONALE DES CONSEILS EN PROPRIETE INDUSTRIELLE IN SUPPORT OF PETITIONER (Aug. 30, 2001)
- [2001 WL 995289](#) (Appellate Brief) BRIEF AMICUS CURIAE OF SEAN PATRICK SUITER IN SUPPORT OF NEITHER PARTY (Aug. 29, 2001)
- [2001 WL 995291](#) (Appellate Brief) BRIEF OF AMICUS CURIAE VINCENT P. TASSINARI IN SUPPORT OF NEITHER PARTY (Aug. 28, 2001)
- [2001 WL 34091971](#) (Appellate Petition, Motion and Filing) Reply to Brief in Opposition (May. 21, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34090273](#) (Appellate Petition, Motion and Filing) Brief in Opposition (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092000](#) (Appellate Petition, Motion and Filing) Brief of Amici Curiae Chiron Corporation, Guilford Pharmaceuticals, Inc., and Xoma in Support of Petition for Writ of Certiorari (May. 09, 2001)[Original Image of this Document with Appendix \(PDF\)](#) 
- [2001 WL 34092004](#) (Appellate Petition, Motion and Filing) Brief of Amici Curiae Massachusetts Institute of Technology; Wisconsin Alumni Research Foundation; State University of New York-Stony Brook, American Council on Education; Cold Spring Harbor Laboratory; University of Texas, Medical Branch at Galveston and M.D. Anderson Cancer Center Houston in Support of Petition for Writ of Certiorari (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092006](#) (Appellate Petition, Motion and Filing) Brief of International Business Machines Corporation, Eastman Kodak Company and Ford Motor Company as Amici Curiae in Support of Respondents (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092011](#) (Appellate Petition, Motion and Filing) Brief of Amicus Curiae Applera Corporation (Applied Biosystems and Celera Genomics) in Support of Respondents (May. 09, 2001)
- [2001 WL 34092012](#) (Appellate Petition, Motion and Filing) Brief for Minnesota Mining and Manufacturing Company et al. as Amici Curiae in Support of Petition for Writ of Certiorari (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092032](#) (Appellate Petition, Motion and Filing) Brief of Amicus Curiae Federal Circuit Bar Association in Support of Petitioner (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092033](#) (Appellate Petition, Motion and Filing) Brief of Amicus Curiae American Intellectual Property Law Association in Support of Petitioners (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092034](#) (Appellate Petition, Motion and Filing) Brief of Amicus Curiae Intellectual Property Creators in support of Festo's Petition for Writ of Certiorari (May. 09, 2001)[Original Image of this Document with Appendix \(PDF\)](#) 
- [2001 WL 34092035](#) (Appellate Petition, Motion and Filing) Brief of Amici Curiae Massachusetts Institute of Technology; Wisconsin Alumni Research Foundation; State University of New York-Stony Brook, American Council on Education; Cold Spring Harbor Laboratory; University of Texas, Medical Branch at Galveston and M.D. Anderson Cancer Center Houston in Support of Petition for Writ of Certiorari (May. 09, 2001)[Original Image of this Document \(PDF\)](#) 
- [2001 WL 34092002](#) (Appellate Petition, Motion and Filing) Brief Amicus Curiae of the Intellectual Property Law Association of Chicago in Support of Neither Party (May. 08, 2001)
- [2001 WL 34092007](#) (Appellate Petition, Motion and Filing) Brief of Amicus Curiae Federation Internationale Des Conseils En Propriete Industrielle in Support of Petition for Writ of Certiorari (May. 08, 2001)[Original Image of this Document with Appendix \(PDF\)](#) 
- [2001 WL 34092008](#) (Appellate Petition, Motion and Filing) Brief of Amicus Curiae Association of Patent Law Firms

in Support of Petitioner (Apr. 27, 2001)[Original Image of this Document \(PDF\)](#)

• [2001 WL 34091958](#) (Appellate Petition, Motion and Filing) Petition for Writ of Certiorari (Apr. 09, 2001)[Original Image of this Document \(PDF\)](#)

• [00-1543](#) (Docket) (Apr. 09, 2001)

• [2000 WL 33979640](#) (Appellate Petition, Motion and Filing) Brief Amicus Curiae of the Chamber of Commerce of the United States in Support of the Petition (May. 09, 2000)[Original Image of this Document \(PDF\)](#)

END OF DOCUMENT

(C) 2005 Thomson/West. No Claim to Orig. U.S. Govt. Works.

## EXHIBIT 5

Translated from the German

7 PAGES

FEDERAL REPUBLIC OF GERMANY  
GERMAN PATENT OFFICE

## OFFENLEGUNGSSCHRIFT

DE 33 16 818

IPC: B 60 R 11/02

B 60 J 3/00

→ Date of application: May 7, 1983  
Date the 'offenlegungsschrift' was laid open to public inspection: November 8, 1984  
Applicant: Hans-Hellmut Ernst [residing in Sülfeld, DE]  
Inventor: the same as the applicant  
[Title in German of the object of the invention:]  
Sonnenblende mit audiovisuellen Einrichtungen

## SUN-VISOR\*, HAVING AUDIOVISUAL DEVICES

Sun-visor\* [\*Translator's note: Also known as sunshield (to eliminate stray light), sun screen; sun shade; rayshade]

(54) The invention pertains to a sun visor in motor vehicles, which provides an expanded utilization possibility for the occupants. In order for the desired comfort, entertainment and information access of the motorists to be improved, a display screen (2), a loudspeaker (3), a control and input keyboard (4)



DEUTSCHES  
PATENTAMT

⑳ Aktenzeichen: P 33 16 818.0  
㉑ Anmeldetag: 7. 5. 83  
㉒ Offenlegungstag: 8. 11. 84

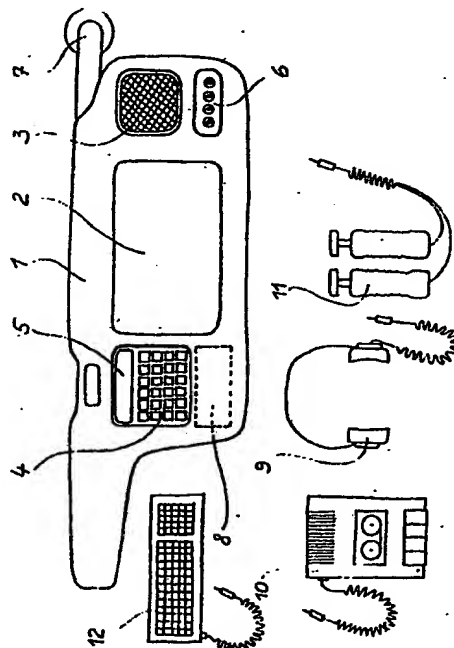
DE 3316818 A1

㉑ Anmelder:  
Ernst, Hans-Hellmut, Dipl.-Ing., 2061 Sülfeld, DE

㉒ Erfinder:  
gleich Anmelder

⑤A Sonnenblende mit audiovisuellen Einrichtungen

Die Erfindung betrifft eine Sonnenblende in Kraftfahrzeugen, die eine erweiterte Nutzungsmöglichkeit für die Insassen bietet. Zur Steigerung der Komfort-, Unterhaltungs- und Informationswünsche der Autofahrer sind auf der Rückseite ein Bildschirm (2), ein Lautsprecher (3), eine Bedienungs- und Eingabetastatur (4) und Anschlußbuchsen (6) in Verbindung mit einem Computersystem (8) integriert. Mit diesen Bauteilen lassen sich TV-Programme empfangen, Videospiele durchführen, visuelle Verkehrsinformationen einblenden, Bild-Telefon-Gespräche führen, EDV-Programme bearbeiten und sonstige Möglichkeiten der audiovisuellen Unterhaltungs- und Informationselektronik nutzen.



DE 3316818 A1

## Patentansprüche

1. Sonnenblende als Blendschutz in Kraftfahrzeugen, die von einer oberen Stellung in eine untere Stellung bewegbar ist, dadurch gekennzeichnet, daß auf der Rückseite der Sonnenblende (1), die im heruntergeklappten Zustand für den Insassen sichtbar wird, ein Bildschirm (2) als Display und Monitor, ein Lautsprecher (3), eine Bedienungs- und Eingabetastatur (4), mehrere Anschlußbuchsen (6) und ein Rechner/Computer/Video-System (8) angebracht sind.
2. Sonnenblende nach Anspruch 1, dadurch gekennzeichnet, daß eine Sonnenblende (1') nur mit einem oder einigen der angegebenen Bauteile (2,3,4,6,8) ausgerüstet ist.

---

### Sonnenblende mit audiovisuellen Einrichtungen

---

Sonnenblenden dienen in Kraftfahrzeugen vorzugsweise für die vorderen Insassen als Blendschutzeinrichtung. Im Falle des starken Lichteinfalls von vorne werden sie von einer oberen Stellung in eine untere Gebrauchsstellung geklappt.

Es sind schon Sonnenblenden bekannt geworden, die für erweitere Aufgabenstellungen mit weiteren Bauteilen bestückt wurden. So, z. B. mit Spiegeln, Leuchten, Parkscheiben oder Brillenhalterungen.

Der Erfindung liegt die Aufgabe zugrunde, die Nutzungsmöglichkeit der Sonnenblende, insbesondere auf der Beifahrerseite, dahingehend zu steigern, daß dem Komfort-, Unterhaltungs- und Informationswunsch der Autofahrer besser entsprochen werden kann.

Diese Aufgabe wird erfindungsgemäß dadurch gelöst, daß in die Sonnenblende auf der Rückseite, die dem Insassen in der heruntergeklappten Stellung zugewandt ist, audiovisuelle Bauteile neuester Technologie (Flachbauweise) und Computerbauteile integriert werden.

Dies können beispielsweise Lautsprecher sein, die in den Sonnenblenden von Fahrer und Beifahrer placiert für einen besonders guten Raumklang und Stereoeffekt sorgen.

Da zukünftig TV-Bildschirme in extremer Flachbauweise und mit geringem Gewicht zur Verfügung stehen werden, lassen sich auch Displays bzw. Monitore für die verschiedensten Zwecke in eine Sonnenblende integrieren.

Desweiteren lassen sich Rechner oder in erweiterter Form kleine Computer-Systeme integrieren. Eine Eingabe- und Bedienungstastatur ist mit allen Bauteilen verbunden und ermöglicht die gewünschte Programmsteuerung.

So lassen sich TV-Programme empfangen, Video-Spiele durchführen, Rechenprogramme aufstellen und auf dem Bildschirm darstellen, Verkehrsinformationen visuell abrufen oder sonstige Wünsche der Unterhaltungselektronik, EDV und Informatik audiovisuell ermöglichen.

Über Anschlußbuchsen 6 lassen sich Kopfhörer 9, Spielpilot-Hebel 11 oder externe Geräte (Autoradio, Bordcomputer, Kassettenabspielgerät 10 für Videospiele oder gespeicherte Programme, Bildtelefon u. ä.) anschließen.

Auf diese Weise ergibt sich sowohl für den privat als auch für den geschäftlich reisenden Mitfahrer die Möglichkeit, die Reisezeit den eigenen Wünschen entsprechend besser zu nutzen.

In der Fig. 1 ist eine Ausführungsform der erfindungsgemäßen Sonnenblende dargestellt. Der Blick ist auf die Rückseite der heruntergeklappten Sonnenblende 1 gerichtet. Den größten Platz in der Mitte nimmt der Bildschirm 2 ein. Er kann wahlweise als Display für den Rechner/Computer 8 oder als Monitor für TV, Videospiele, Verkehrsinformationen oder Bildtelefon genutzt werden. Entsprechend vielseitig ist der Gebrauch des Lautsprechers 3. Die Bedienungs- und Eingabetastatur 4 ist für die Steuerung und Regelung der audiovisuellen Bauteile (2,3,6) und des Rechners/Computers 8 ausgelegt. Über die Anschlußbuchsen 6 lassen sich weitere Aggregate mit dem System verbinden. Eine externe Eingabetastatur 12, ein Kassettenabspielgerät 10 für das Laden und Speichern von Programmen oder Videospiele, ein Kopfhörer 9 oder Spielpilot-Hebel 11.

#### Bezeichnungen

- |    |                                 |
|----|---------------------------------|
| 1  | Sonnenblende                    |
| 2  | Bildschirm                      |
| 3  | Lautsprecher                    |
| 4  | Bedienungs- und Eingabetastatur |
| 5  | Zeilen-Display                  |
| 6  | Anschlußbuchsen                 |
| 7  | Halterung                       |
| 8  | Rechner/Computer/Videospiel     |
| 9  | Kopfhörer                       |
| 10 | Kassettenabspielgerät           |
| 11 | Spielpilot-Hebel                |
| 12 | Externe Eingabetastatur         |

-4-  
- Leerseite -



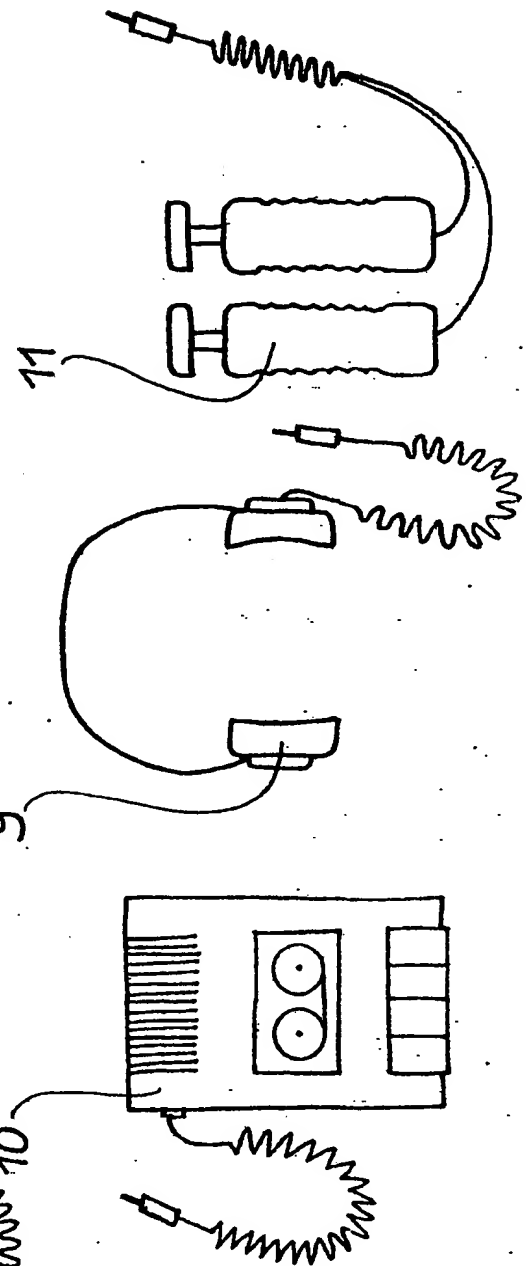
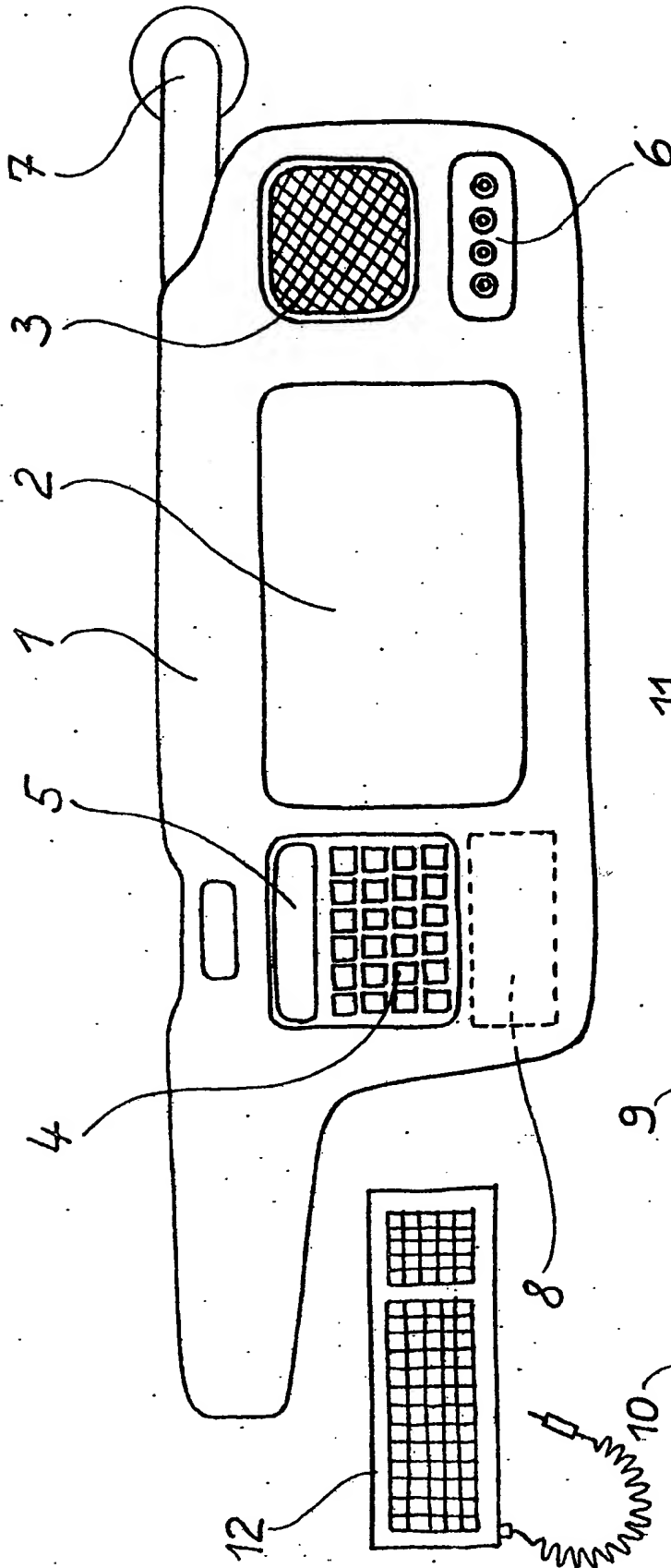


EXHIBIT 6

3 PAGES

In the United States Patent and Trademark Office

Serial Number: 09/232,566

Appn. Filed: 01/15/1999

Applicant: Rolf Jansen

Appn. Title: Tractor/Trailer Back-up Kit

Examiner/GAU: Tung Vo/2613

Mailed: 6/30/05

At: Houston, Texas

Request for Copy of Missing Reference

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In the Office Action mailed June 22, 2005, copy of the German patent DE 3316818 was enclosed, but only the first page of the translation was enclosed.

On page 3 of the Office Action, the examiner makes comments pertaining to pages 4 and 5 of the translation.

Since the applicant has a deadline to meet in responding to the Office Action, all the time waiting to receive the complete translation takes away from time available to prepare the response. THEREFORE, the applicant requests that a complete copy of the translation be mailed to him as soon as possible.

Respectfully submitted,

Rolf Jansen

Rolf Jansen, Applicant, pro se

P.O. Box 73161

Houston, TX 77273

Request for Copy of Missing Reference (Ser. No. 09/232,566) 2.

Certificate of Mailing

I certify that this correspondence will be deposited with the United States Postal Service as first class mail with proper postage affixed in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450."

Date: 6/30/05

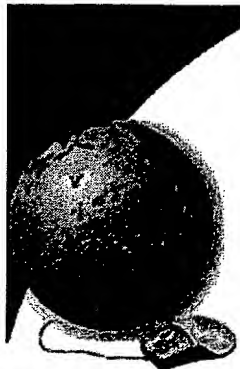
Rolf Jansen  
Rolf Jansen, Applicant

Received today Request for Copy of Missing  
Reference, from Applicant Rolf Jansen,  
Serial Number 09/232,566, Appn. Filed  
01/15/1999, Appn. Title, Tractor/Trailer  
Back-up Kit, Examiner/GAU, Tung Vo/2613



EXHIBIT 7

1 PAGE



accommodations  
budget lodgings

outdoor activities  
adventure treks  
bus and walking tours

available in  
160 countries

Join

protected by  
VeriSign

provided by  
webreservations  
international  
travel-island.com

Search in travel-island.com

Search Help Site Map

## Car Driving Information for Germany



driving information



### Overview

#### General Info

Germany was the first country in the world to develop a national system of superhighways, and for many years its Autobahn system was a model for other nations. After unification, Autobahns in the eastern part of the country were significantly upgraded. Today Germany has nearly 6,000mi/9660km of Autobahns and an extremely well developed network of lesser highways. This makes traversing this country exceptionally easy and pleasant, and the German network is interconnected with networks in neighboring countries. Germany is about 500mi/805km long (from north to south) and 400mi/644km wide in its longest dimensions.

#### Requirements

You must be at least 21 years old (age may vary by car category) and have held your license for 1-3 years depending on the car category reserved. Drivers age 21-22 must purchase CDW. Drivers under the age of 25 may incur a young driver surcharge. Child safety seats are mandatory for children up to age 6. Seatbelts are mandatory.

#### Speed Limits

Speed limits in Germany are as follows: City 31mph/50kph Open Roads 62mph/100kph Highways 81mph/130kph is recommended but most autobahns have no speed limit.

#### Rules of the Road

Traffic travels on the right and streetcars do not have the right of way. They should be passed on the right on a two way street and on either side on a one-way street. Avoid the far left lane on the autobahn as speeds can easily exceed 100mph/161kph.

#### Fuel

Most fuel stations are open from 8am to 8pm. There are stations open 24 hours in some major cities and on the autobahn.

#### Tolls

There are no toll highways in Germany.

#### Parking

Parking is allowed only on the right side of the road except on one-way streets where both sides are valid. Parking spaces with meters are usually free of charge at night.

#### Car Rental Restrictions

#### General Information

Most car categories can be driven anywhere in Western Europe without restriction. Due to insurance regulations, there are restrictions on luxury car categories and on

EXHIBIT 8

3 PAGES

**Newnes  
Television  
and  
Video Engineer's  
Pocket Book**

**Third edition**

Eugene Trundle, TMIE (elect), MRTS, MISTC

**BEST AVAILABLE COPY**



**Newnes**

OXFORD AUCKLAND BOSTON  
JOHANNESBURG MELBOURNE NEW DELHI

Newnes

An imprint of Butterworth-Heinemann

Linacre House, Jordan Hill, Oxford OX2 8DP

225 Wildwood Avenue, Woburn, MA 01801-2041

A division of Reed Educational and Professional Publishing Ltd



A member of the Reed Elsevier plc group

First published 1987

Reprinted 1987

Second edition 1992

Reprinted 1994, 1995, 1996, 1997

Third edition 1999

© Eugene Trundle 1999

All rights reserved. No part of this publication may be reproduced in any material form (including photocopying or storing in any medium by electronic means and whether or not transiently or incidentally to some other use of this publication) without the written permission of the copyright holder except in accordance with the provisions of the Copyright, Designs and Patents Act 1988 or under the terms of a licence issued by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London, England W1P 9HE. Applications for the copyright holder's written permission to reproduce any part of this publication should be addressed to the publishers

**British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library.

ISBN 0 7506 4194 0

**Library of Congress Cataloguing in Publication Data**

A catalogue record for this book is available from the Library of Congress.

Typeset by The Midlands Book Typesetting Company, Loughborough  
Printed by Antony Rowe Ltd, Chippenham, Wilts



BEST AVAILABLE COPY

BEST AVAILABLE COPY

and via mirrors. Not all scenes are amenable to auto-focusing; sometimes the main picture feature is not central in the frame, and sometimes a degree of defocusing of some or all of the televised scene is required for production or artistic effects. For these reasons, and to conserve battery power where applicable, the auto-focus facility can be switched off.

The current trend is to use the video signal itself as reference for the auto-focus system as shown in Fig. 6.11. It generally gives more accurate results, and permits a choice of zone sizes for focus sampling.

## VIEWFINDERS

The camera's electronic viewfinder (EVF) has three main functions. It frames the shot for the operator and checks optical focus during shooting; it relays information from the camera's system-control section on settings, status and operational mode; and it acts as picture monitor during in-the-field playback in the case of a camcorder. It is difficult to manufacture a very small colour screen with good enough colour fidelity to accurately judge the picture hue, or with sufficient definition to permit accurate optical focusing, especially with high-band and digital cameras.

The norm, then, is a black-and-white viewfinder tube of about 2.5 cm diagonal mounted in a 'chicken-leg' housing hinged at its back end on the top surface of the camera. It has an eyepiece and viewing lens with focus adjustment. The display tube is necessarily a low-energy device with small deflection angle. As in larger picture tubes, magnetic deflection and electrostatic beam-focus systems are used. The VF tube is driven by what amounts to a complete monitor circuit, including video amplifier and output stage; sync separator; time-bases; and high-voltage supplies for the picture-tube, the whole being miniaturised and designed to operate from its own (typically 5 V) supply rail, derived from the camera's own power supply via a stabiliser/regulator circuit. No external controls are needed, though brightness and beam-focus controls may be provided as semi-accessible presets. This complete independence of the EVF system is necessary to enable the viewfinder to perform its role as a video monitor during tape replay when the camera section is switched off. Although physically very small, the components and techniques of the EVF are just the same as are used in the TV receiver and monitors covered in the first half of this book.

## BEST AVAILABLE COPY

### Colour EVF

The fact that colour viewfinders struggle to do justice to the performance of a good video camera has not prevented manufacturers incorporating them in home-movie camcorders! A few models offer the best of both worlds, with a conventional black-and-white VF tube plus a small (4–10 cm diagonal) colour LCD display in a fold-out panel on one side of the camcorder body. In the *Viewcam* the rear panel of the camcorder consists of a colour LCD panel of 8–10 cm diagonal. While suffering from the above-mentioned shortcomings as a camera viewfinder, it does have the advantages of not needing to be held to the eye while shooting, and of affording more than one viewer (with difficulty!) to watch the playback on location. A third class of camcorder sports a conventional viewfinder housing, but it contains a mini-LCD panel in place of the little monochrome tube, again with an eyecup and lens. This stretches the cost versus performance of LCD technology tight, and the 'chicken-wire overlay' effect on the VF image can be very obtrusive.

### VIEWFINDER INDICATIONS

All feedback to the camcorder operator comes via the viewfinder screen, composed and superimposed on the picture by a character-generator IC, which may be incorporated in the main processor chip. Working on indications sent to the processor from sensors on the tape deck, in the camera section and elsewhere, the character generator provides a wide range of status, indication and warning symbols, plus – very often – a simple titling facility so that captions and titles can be recorded on tape.

### CAMCORDERS

Camcorders combine the camera principles described in this chapter with the videorecorder systems described in Chapters 13–19 of this book, and use miniature deck assemblies and (often) small head drums. They use either low- or high-band formats (see Chapter 14) and small cassettes of the Video 8 or VHS-C type. Hi-Fi stereo sound, either in f.m. or pulse-code form, is also incorporated in some models. Digital cameras will be dealt with in Chapter 19.

The requirements of small size, light weight and minimum power consumption, together with competition between makers and formats for the best performance and greatest sophistication, has put camcorders in the forefront of electronic technology. Surface-mounted



EXHIBIT 9

8 PAGES

BEST AVAILABLE COPY

# Troubleshooting and Repairing Camcorders

Homer L. Davidson

BEST AVAILABLE COPY

TAB Books

Division of McGraw-Hill, Inc.

Blue Ridge Summit, PA 17294-0850

BEST AVAILABLE COPY

FIRST EDITION  
FOURTH PRINTING

→ © 1990 by TAB Books.  
TAB Books is a division of McGraw-Hill, Inc.

Printed in the United States of America. All rights reserved. The publisher takes no responsibility for the use of any of the materials or methods described in this book, nor for the products thereof.

**Library of Congress Cataloging-in-Publication Data**

Davidson, Homer L.

Troubleshooting and repairing camcorders / by Homer L. Davidson.

p. cm.

ISBN 0-8306-8337-2 ISBN 0-8306-3337-5 (pbk.)

1. Camcorders—Maintenance and repair. I. Title.

TR882.D39 1990

621.388'337—dc20

89-29141

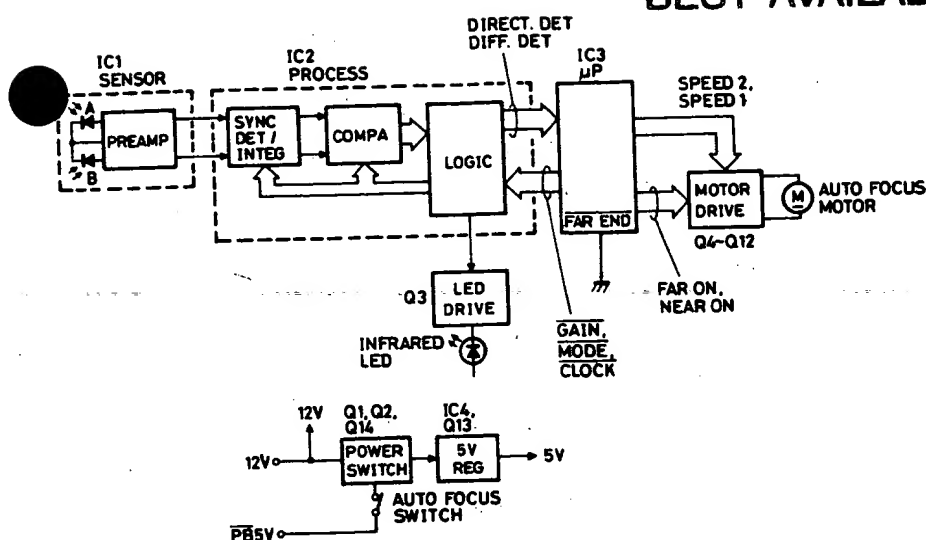
CIP

Acquisitions Editor: Roland S. Phelps

Director of Production: Katherine G. Brown

Book Design: Jaclyn J. Boone

BEST AVAILABLE COPY



3-33 RCA CPR100 auto focus block diagram. RCA

microprocessor IC3. The output signal from IC3 is applied to the motor drive circuits (Q4 through Q12), operating the auto focus motor (FIG. 3-34).

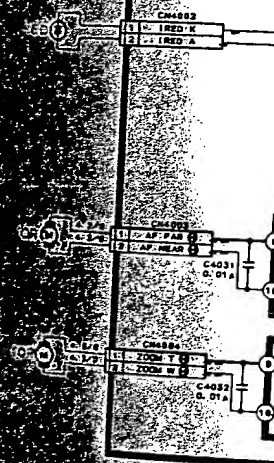
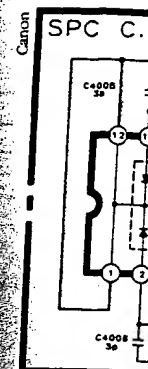
### THE ELECTRONIC VIEWFINDER

Although the most recent camcorders have the electronic viewfinder, some of the smaller cameras have the optical viewfinder. The electronic viewfinder (EVF) permits monitoring the image being shot or played back. The electronic viewfinder looks and acts somewhat like the small black-and-white TV chassis. The EVF unit is found at the front of the camcorder (FIG. 3-35).

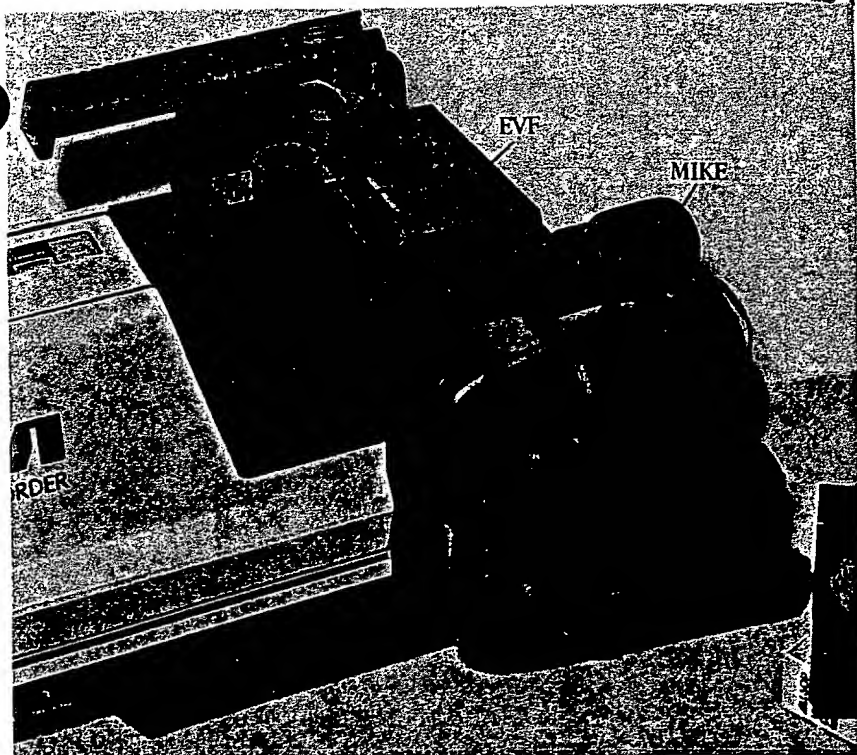
The EVF circuits consist of a miniature picture tube with horizontal and vertical deflection circuits. The flyback transformer provides high voltage to the CRT. Vertical and horizontal sync circuits are generated and fed to the EVF deflection and VCR system control circuits. A small amplifier and sync separation circuit round up the EVF circuits (FIG. 3-36).

**Pentax PV-C850 (8 mm) Electronic Viewfinder Circuits** The EVF circuits consist of the video, vertical and horizontal deflection, and high-voltage circuits. The video is applied at pin 10 of IC1801 (FIG. 3-37). The video signals from the main circuit board in the VTR come out through pin 11, and are amplified by IC1801 and applied to the grid of the CRT after passing through amplifier Q1802.

The video signal passing through the low-pass filter (LPF), which removes spurious high-frequency components, is applied to the sync separator circuits, which separate the vertical and horizontal sync signals. The vertical sync separator separates the vertical sync signal from the composite sync signal. The vertical oscillator generates a sawtooth waveform to the vertical drive, which produces vertical drive signal (pins 16 and 17) to the vertical deflection coils.



BEST AVAILABLE COPY



**3-35** Location of the electronic viewfinder (EVF) in the RCA CPR300 camcorder.

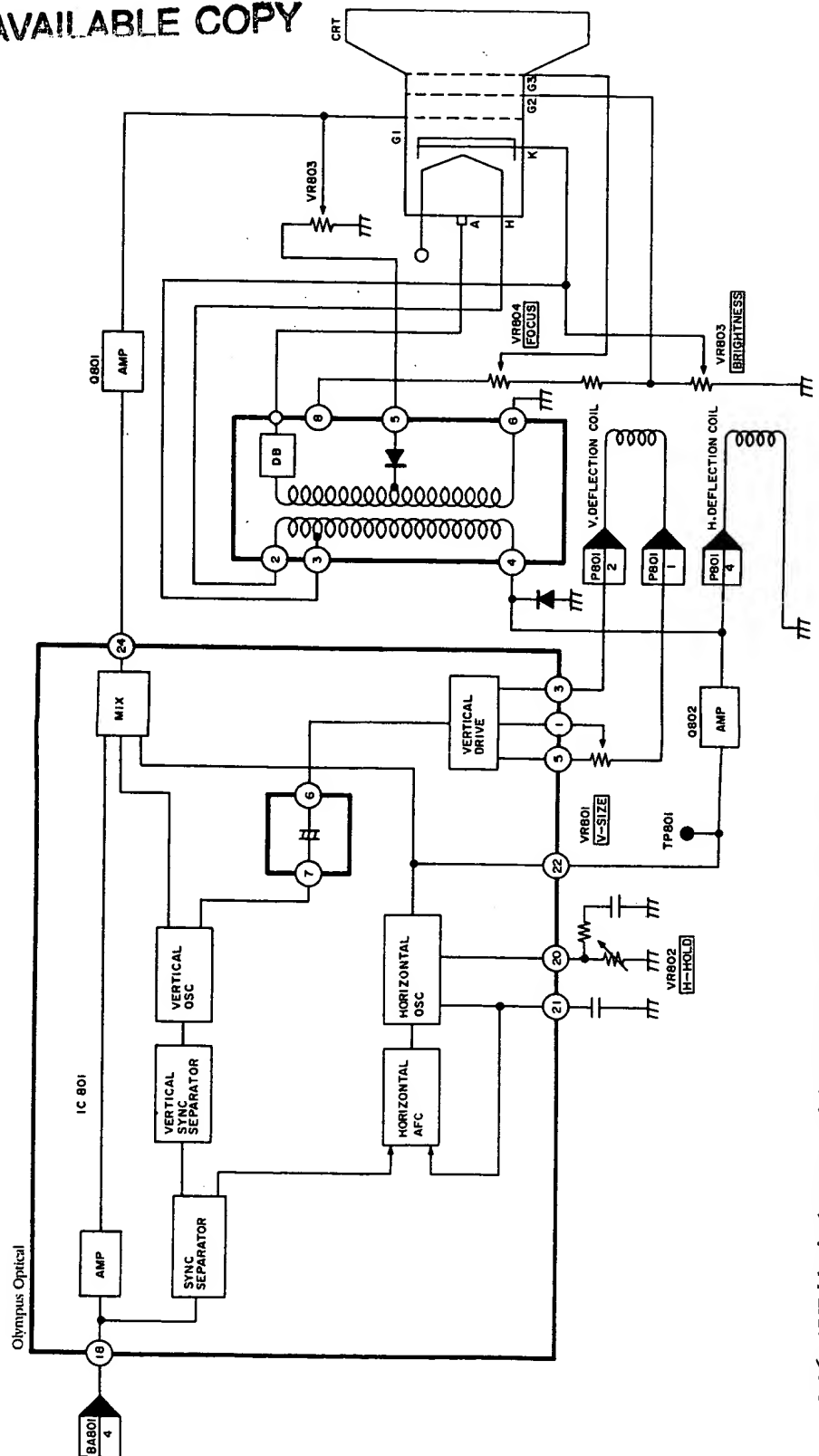
In the high-voltage circuit, the horizontal drive circuit generates the high voltage for the CRT (FIG. 3-38). Pin A of T1801 supplies 2.5 kV to the anode of the CRT. Pin B supplies approximately 500 V to the focus circuits. R1823 and R1824 provide a dividing circuit that supplies 250 V to grid 2. Pin 4 supplies approximately 70 V to the brightness circuits. Pins 1 and 6 supply a flyback pulse to light the filament of the CRT.

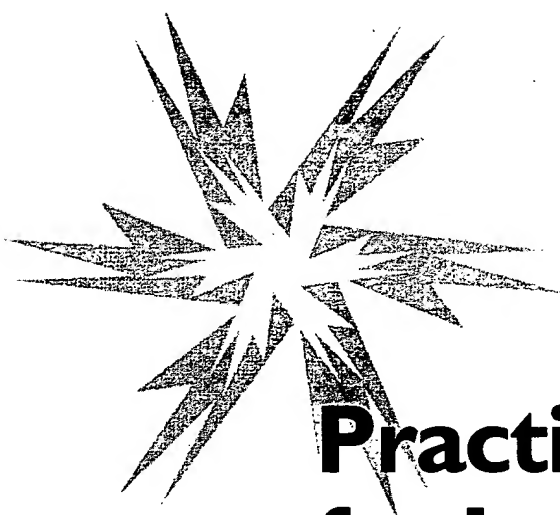
**Realistic 150 (VHS-C) Electronic viewfinder (EVF)** In some camcorders, the EVF assembly is locked in place with a sliding plastic lock assembly (FIG. 3-39). The EVF assembly may be adjusted to either side for easy viewing. Push the lock to one side and the EVF assembly can be removed after removing the EVF plug-in cable to the camera section.

IC1801 amplifies the video signal and provides sync separation, vertical oscillator, vertical drive, and horizontal oscillator circuits in one IC. The video output at pin 5 of IC1801 is applied to the video grid 1 through a driver (Q1802) (FIG. 3-40).

After the video signal enters the low-pass filter (C1818, R1817, LPF), which removes high-frequency components, it enters IC1801 at pin 11. The sync separator separates the composite sync signal from the sync signal and is applied to the vertical sync separator and H sync phase detector circuit

BEST AVAILABLE COPY





# **Practical Electronics for Inventors**

**Paul Scherz**

**McGraw-Hill**

New York San Francisco Washington, D.C. Auckland Bogotá  
Caracas Lisbon London Madrid Mexico City Milan  
Montreal New Delhi San Juan Singapore  
Sydney Tokyo Toronto

Cataloging-in-Publication Data is on file with the Library of Congress

**McGraw-Hill**

*A Division of The McGraw-Hill Companies*



Copyright © 2000 by The McGraw-Hill Companies, Inc. All rights reserved.  
Printed in the United States of America. Except as permitted under the United States  
Copyright Act of 1976, no part of this publication may be reproduced or distributed in  
any form or by any means, or stored in a data base or retrieval system, without the  
prior written permission of the publisher.

3 4 5 6 7 8 9 10 11 QWK 0 9 8 7 6 5 4 3 2 1 0

ISBN 0-07-058078-2

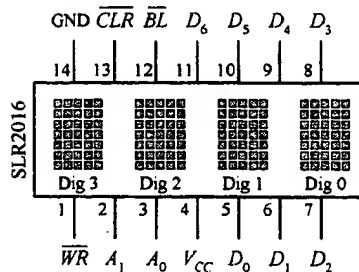
The sponsoring editor for this book was Scott Grillo, the editing supervisor was Steven Melvin,  
and the production supervisor was Sherri Souffrance.  
It was set in Palatino by North Market Street Graphics.  
Phoenix Color was printer and binder.



This book is printed on recycled, acid-free paper containing a minimum of  
50% recycled, de-inked fiber.

Information contained in this work has been obtained by The McGraw-Hill Companies, Inc.  
("McGraw-Hill") from sources believed to be reliable. However, neither McGraw-Hill nor its  
authors guarantee the accuracy or completeness of any information published herein and  
neither McGraw-Hill nor its authors shall be responsible for any errors, omissions, or dam-  
ages arising out of use of this information. This work is published with the understanding  
that McGraw-Hill and its authors are supplying information, but are not attempting to ren-  
der engineering or other professional services. If such services are required, the assistance of  
an appropriate professional should be sought.

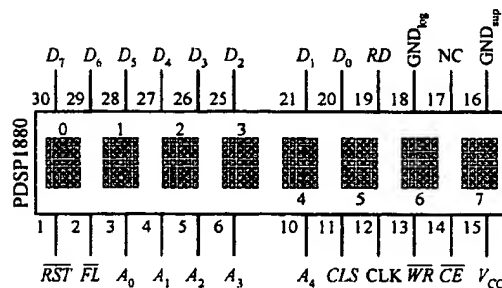
**SLR2016 (Siemens) 4-Digit 5 x 7 Dot Matrix  
Alphanumeric Intelligent Display**



SLR2016 Character Set

ANGLE CODE	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100										
10	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
11	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
12	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
13	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
14	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
15	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
16	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
17	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
18	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
19	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
20	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
21	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
22	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
23	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
24	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
25	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
26	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	5																																													

**PDSP1880 (Siemens) 8-Character 5 x 7 Dot Matrix Alphanumeric Programmable Display**



## PDSP1880 Character Set

[illegible]

FIGURE I.9

### 1.3 Liquid-Crystal Displays

In low-power CMOS digital systems (e.g., battery- or solar-powered electronic devices), the dissipation of an LED display can consume most of a system's power requirements, something you want to avoid, especially since you are looking to save power when using CMOSs anyway. Liquid-crystal displays (LCDs), on the other hand, are ideal for low-power applications. Unlike a LED display, an LCD is a passive device. This means that instead of using electric current to generate light, it uses light that is already externally present (e.g., sunlight, room lighting). For the LCD's optical effects to occur, the external light source need only supply a minute amount of power (within the  $\text{mW}/\text{cm}^2$  range).

One disadvantage with LCDs is their slow switching speeds (time it takes for a new digit/character to appear). Typical switching speeds for LCDs range from



**EXCLUSIVE Ratings**  
of top **DIETS**

**COMPUTERS**  
Best tech support

**FILTERING**  
software

EXHIBIT 10  
2 PAGES

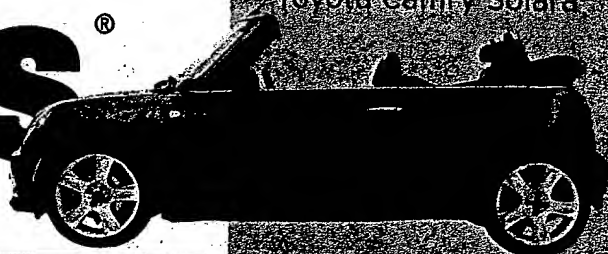
# Consumer Reports®

BEST AVAILABLE COPY

**COOL  
CONVERTIBLES**

Including:

- Ford Mustang
- Mini Cooper
- Toyota Camry Solara



JUNE 2005

EXPERT • INDEPENDENT • NONPROFIT

[www.ConsumerReports.org](http://www.ConsumerReports.org)

**UNBIASED  
RATINGS  
202  
PRODUCTS**

**Best laptops**

Apple, Dell, HP, IBM,  
Sony, Toshiba

**Outdoor grills**

Why the priciest are  
NOT the best

**Exterior house  
paints & stains**

Looks that last

**Safety alert**

Why you may NOW be  
allergic to seafood

**LUS**

**MyFi portable  
satellite radio**

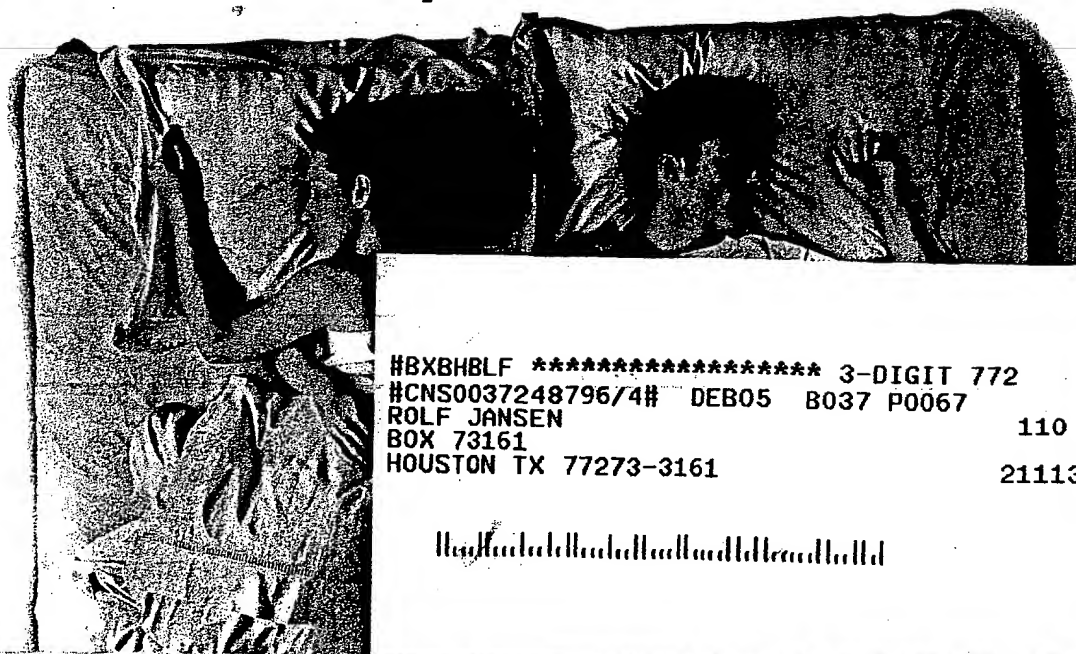
**the diets**

Atkins  
Slim-Fast  
Weight Watchers

## How to buy a mattress without losing sleep

- What's best for YOU:  
Duxiana, Select Comfort, Tempur-Pedic,  
or some other brand?
- Are pricey brands WORTH THE PRICE?
- Is FIRMER really BETTER?

BEST AVAILABLE COPY



#BXHBLF \*\*\*\*\* 3-DIGIT 772  
#CNS0037248796/4# DEB05 B037 P0067  
ROLF JANSEN  
BOX 73161  
HOUSTON TX 77273-3161

110

21113



# COMPUTER MONITORS

## More screen for less

BEST AVAILABLE COPY

In computer monitors, as in TVs, models with LCD technology are becoming bigger, cheaper, and more dominant in the marketplace.

During 2004, the liquid-crystal display market shifted distinctly from 15-inch monitors to 17- and 19-inch models. Prices for 17-inch models, the size most people buy, now start at \$250, compared with \$450 last year. And 60 percent of the computer monitors now sold in the U.S. are LCDs.

LCDs are beginning to dominate the monitor market for practical reasons: They take up far less desk space than a CRT, or cathode-ray tube, monitor and weigh about 15 pounds, vs. 30 to 50 pounds for a CRT. But a CRT still has some advantages (see CloseUp, below).

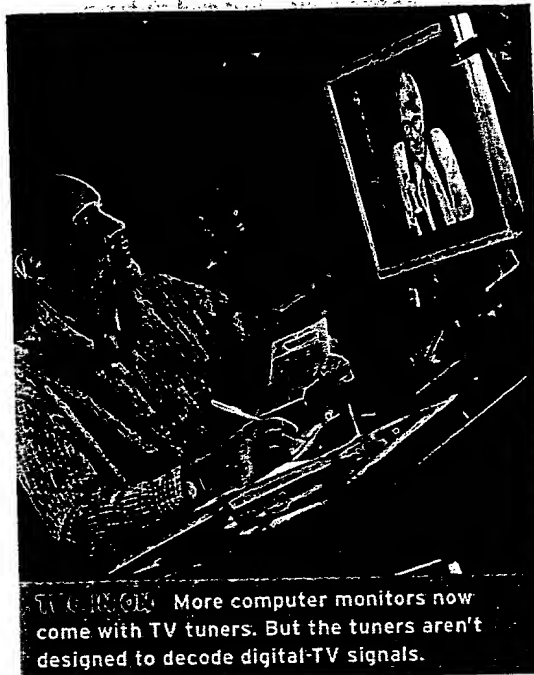
Here's what we found in our latest tests of LCD monitors:

**They're getting wider.** More LCDs have screens with the wide shape found on digital TVs. The width is handy for viewing and editing photos and running multiple programs.

**They're more versatile.** More than half the models we tested had stands that allow you to lift, lower, or tilt the screen. That's useful because LCD screens are less bright and sharp when viewed at an extreme angle. More LCDs can rotate from a landscape to portrait orientation—a handy feature when you want to view documents or Web pages.

**Convergence with TVs isn't here yet.** Computer equipment and TV sets are becoming a little more alike. Samsung, Sony, and others now offer monitors with TV tuners and LCD TVs with computer connections. But big differences between the two types of devices still remain.

While both share LCD technology, monitors designed for computer use generally display computer content



More computer monitors now come with TV tuners. But the tuners aren't designed to decode digital-TV signals.

more clearly than TV sets do. Computer monitors with built-in TV tuners cost \$100 to \$200 more than those without and can't decode digital broadcasts.

### HOW TO CHOOSE

**Consider your budget.** For a monitor to use with a \$500 computer, an economical CRT may make the most sense.

**Consider how you'll use it.** For most tasks, a 17-inch monitor is fine. But if you have poor vision, routinely edit photos,

run several programs at once, or play games often, consider models that are 19 inches or larger.

**Consider controls.** Look for conveniently placed buttons that adjust contrast, brightness, and other settings that affect the image. Some sleek designs hide their controls, making adjustments more difficult.

**Consider viewing angle.** Images on LCD screens fade as you move left, right, up, or down. Many models (see the Ratings) have a wider viewing angle than we've seen in the past.

**Shop for the best warranty.** Look for three-year parts-and-labor coverage, especially with expensive models.

**Donate or recycle your old CRT.** If your CRT works, keep it as a spare or donate it at [www.cristina.org](http://www.cristina.org). Otherwise, check with local agencies to find out if your municipality has a recycling program that accepts electronic waste. Many offer collection or drop-off programs. Also consult the following Web sites for recycling sources in your area: [www.eiae.org/index.cfm](http://www.eiae.org/index.cfm) and [www.earth911.org](http://www.earth911.org).

## closeup

### REASONS TO CONSIDER A CRT

**Big and bulky,** a CRT monitor can gobble up a huge section of your desktop, be difficult to maneuver or move, and consume twice as much energy—up to 80 watts—as a comparably-sized LCD. Nevertheless, for some people, it may still be worth considering, for these reasons:

**A CRT offers the most screen for the money.** A 19-inch model can be on your desk for less than \$200, compared with \$350 and up for an LCD.

**It may perform very well.** Two 17-inch models (16-inch viewable-image size) we tested, the IBM ThinkVision C170, \$185, and the IBM E74, \$140, performed better overall than half the LCDs in the Ratings.

**It's superior for photographers, designers, and gamers.** CRTs generally deliver slightly truer colors, making them the preferred medium for graphic designers and digital photographers. They also render fast-moving objects better than LCDs, making them attractive to serious gamers. Unlike LCDs, they can be readily viewed from extreme angles.



**BULKY** Most CRTs' depth equals their screen size.

EXHIBIT 11

11 PAGES



US005680123A

**United States Patent** [19]  
**Lee**

[11] Patent Number: **5,680,123**  
 [45] Date of Patent: **Oct. 21, 1997**

[54] **VEHICLE MONITORING SYSTEM**

[76] Inventor: **Gul Nam Lee**, 15428 Wilder Ave.,  
 Norwalk, Calif. 90650

5,424,952 6/1995 Asayama ..... 364/443  
 5,430,431 7/1995 Nelson ..... 340/434  
 5,530,421 6/1996 Marshall et al. .... 340/435  
 5,570,127 10/1996 Schmidt ..... 348/148

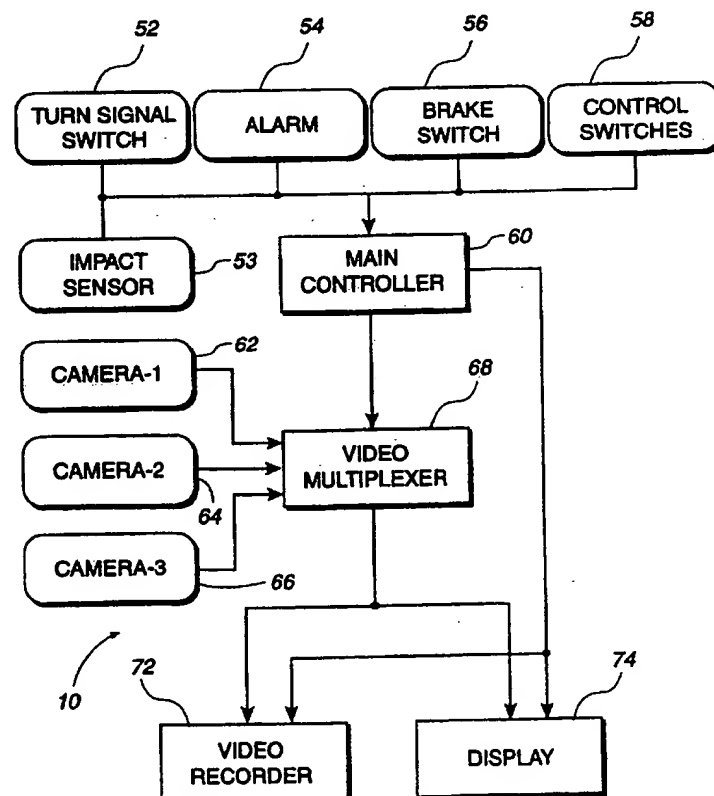
[21] Appl. No.: **692,593**[22] Filed: **Aug. 6, 1996**[51] Int. Cl.<sup>6</sup> ..... **G08G 1/017**[52] U.S. Cl. .... **340/937; 340/435; 340/903;**  
**348/148**[58] Field of Search ..... **340/937, 426,**  
**340/435, 436, 903; 348/148, 149**[56] **References Cited****U.S. PATENT DOCUMENTS**

4,260,980 4/1981 Bates ..... 340/32  
 4,694,295 9/1987 Miller et al. .... 340/903  
 5,027,104 6/1991 Reid ..... 340/426  
 5,280,555 1/1994 Ainsburg ..... 385/116  
 5,307,136 4/1994 Saneyoshi ..... 356/1  
 5,355,118 10/1994 Fukuhara ..... 340/435

Primary Examiner—Jeffery Hofsass  
 Assistant Examiner—Anh La

[57] **ABSTRACT**

The vehicle monitoring system uses a plurality of video cameras mounted on various location of a vehicle to detect and display objects not readily visible to the vehicle operator. In particular, video cameras are placed on each side of the vehicle and, preferably, on the rear portion of the vehicle. Each camera is connected to a display unit and/or a video recorder through a video multiplexer which is controlled by a main controller. The views from different cameras are displayed or recorded in response to the position of a turn signal control switch. Alternatively, the cameras can be activated when a vehicle alarm is triggered or when the vehicle is hit from the behind.

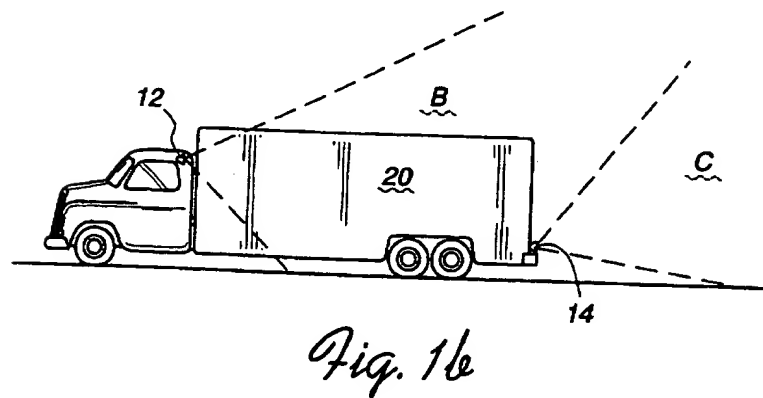
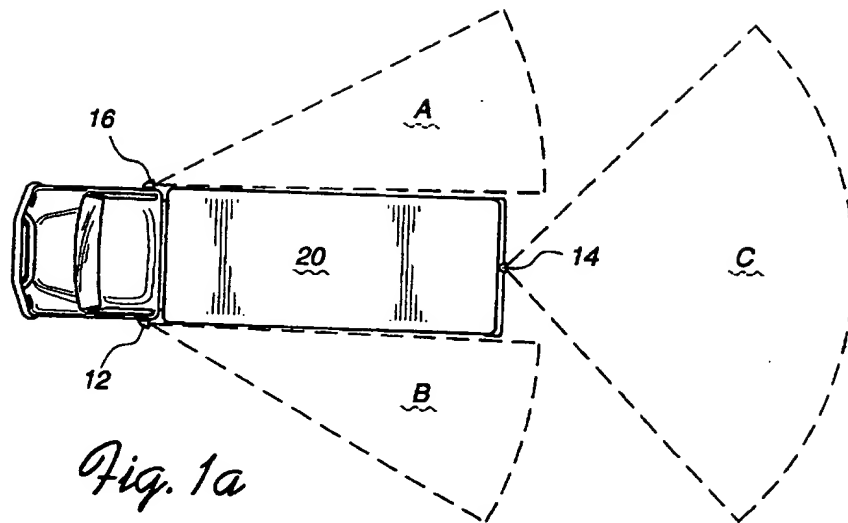
**8 Claims, 5 Drawing Sheets**

U.S. Patent

Oct. 21, 1997

Sheet 1 of 5

5,680,123

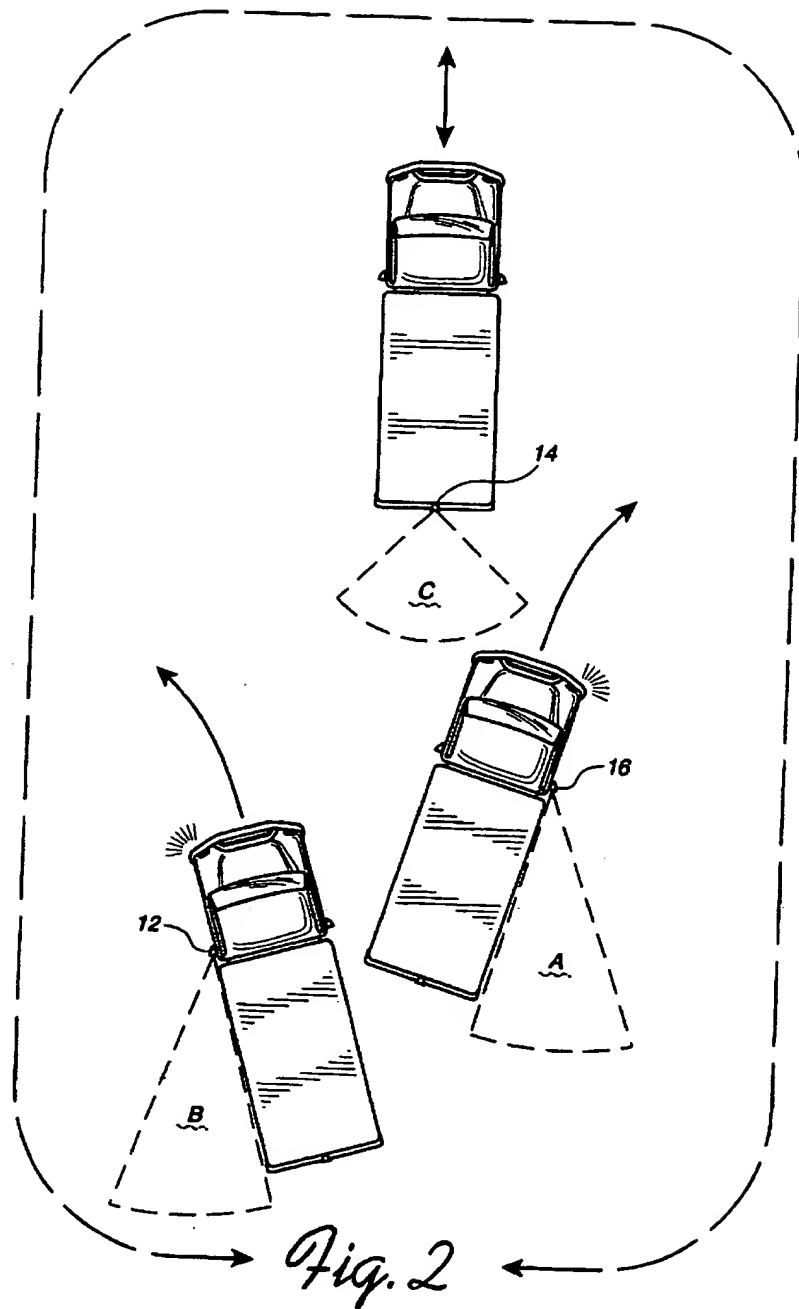


U.S. Patent

Oct. 21, 1997

Sheet 2 of 5

5,680,123

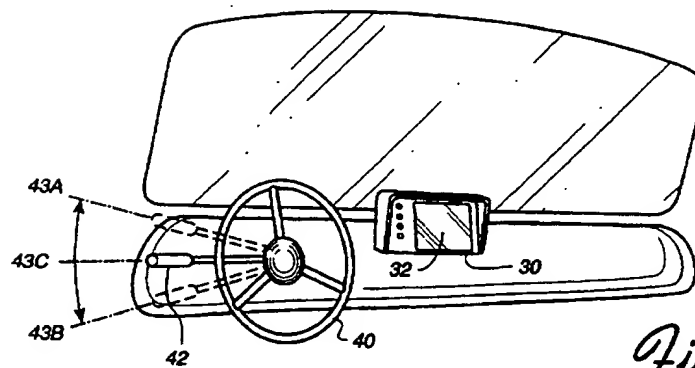
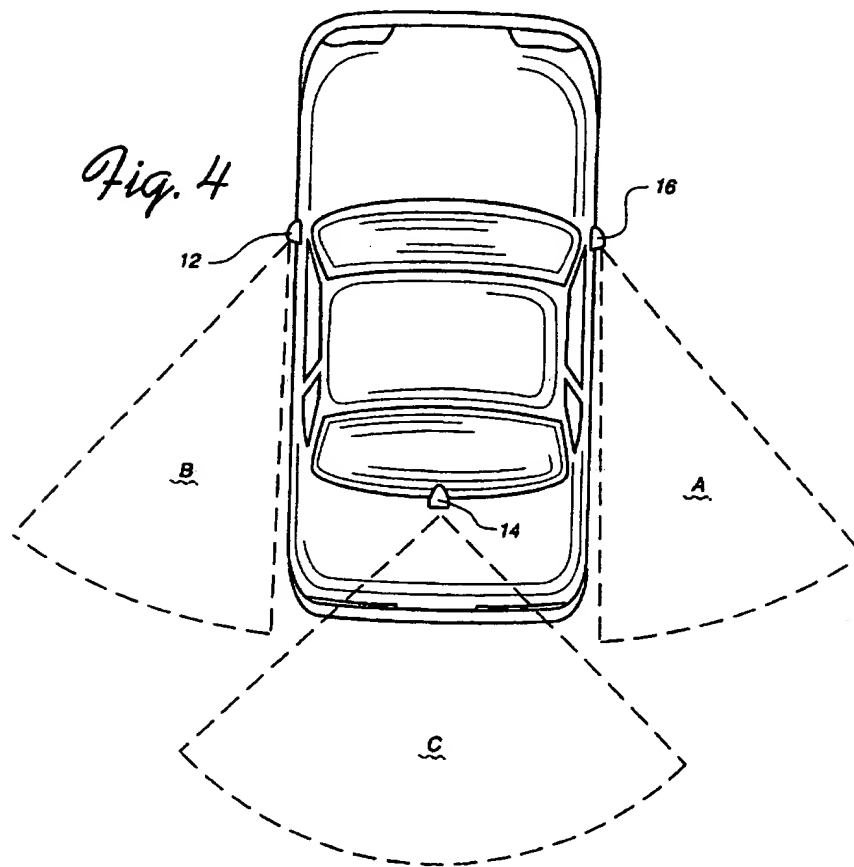


U.S. Patent

Oct. 21, 1997

Sheet 3 of 5

5,680,123

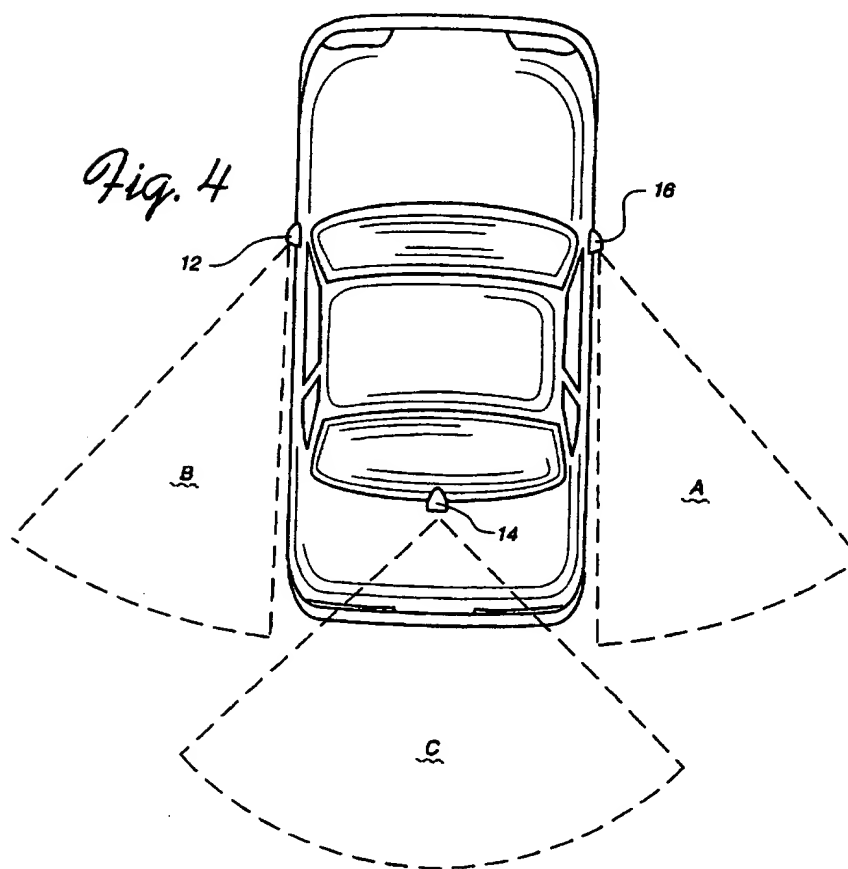
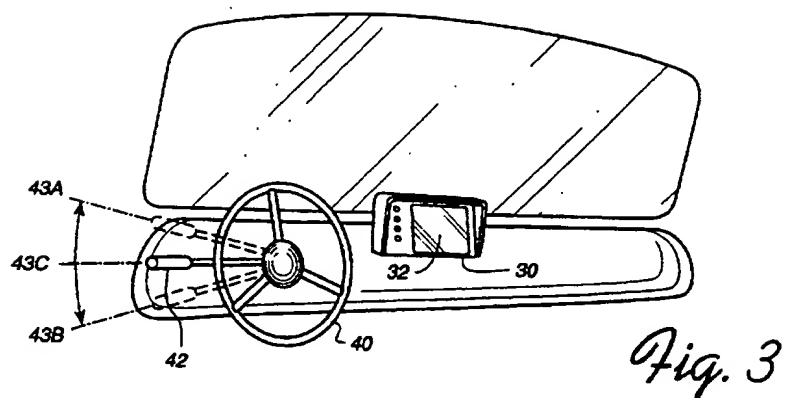
*Fig. 3**Fig. 4*

U.S. Patent

Oct. 21, 1997

Sheet 3 of 5

5,680,123

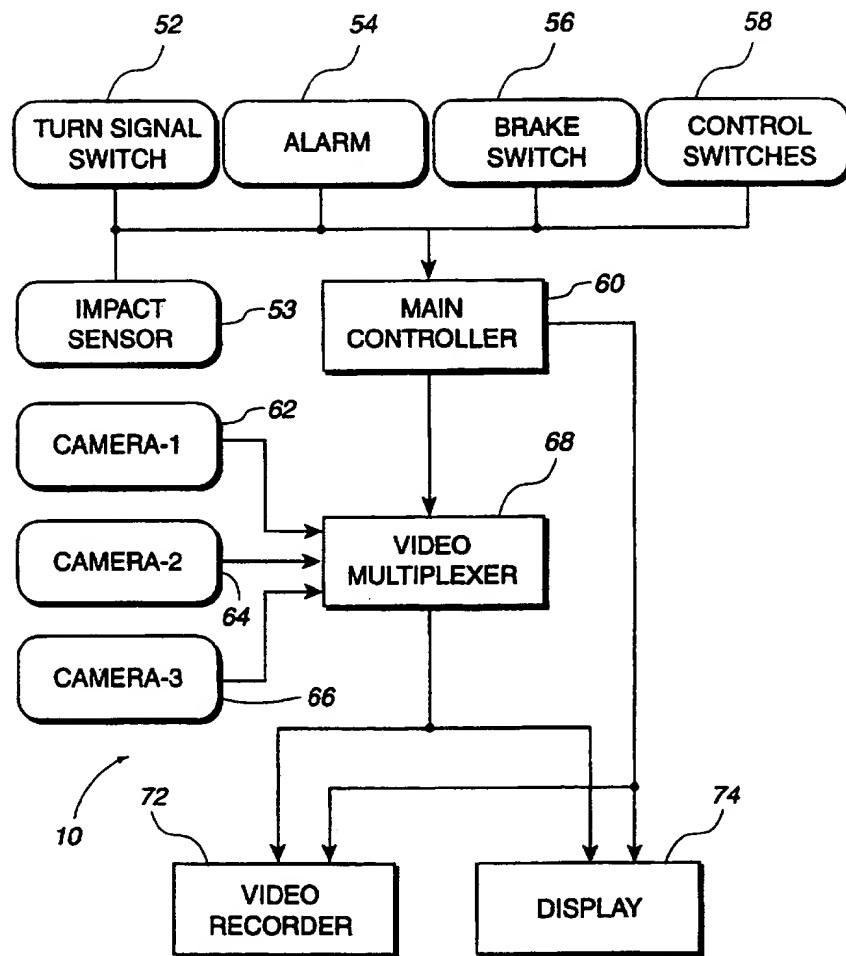


U.S. Patent

Oct. 21, 1997

Sheet 4 of 5

5,680,123

*Fig. 5*

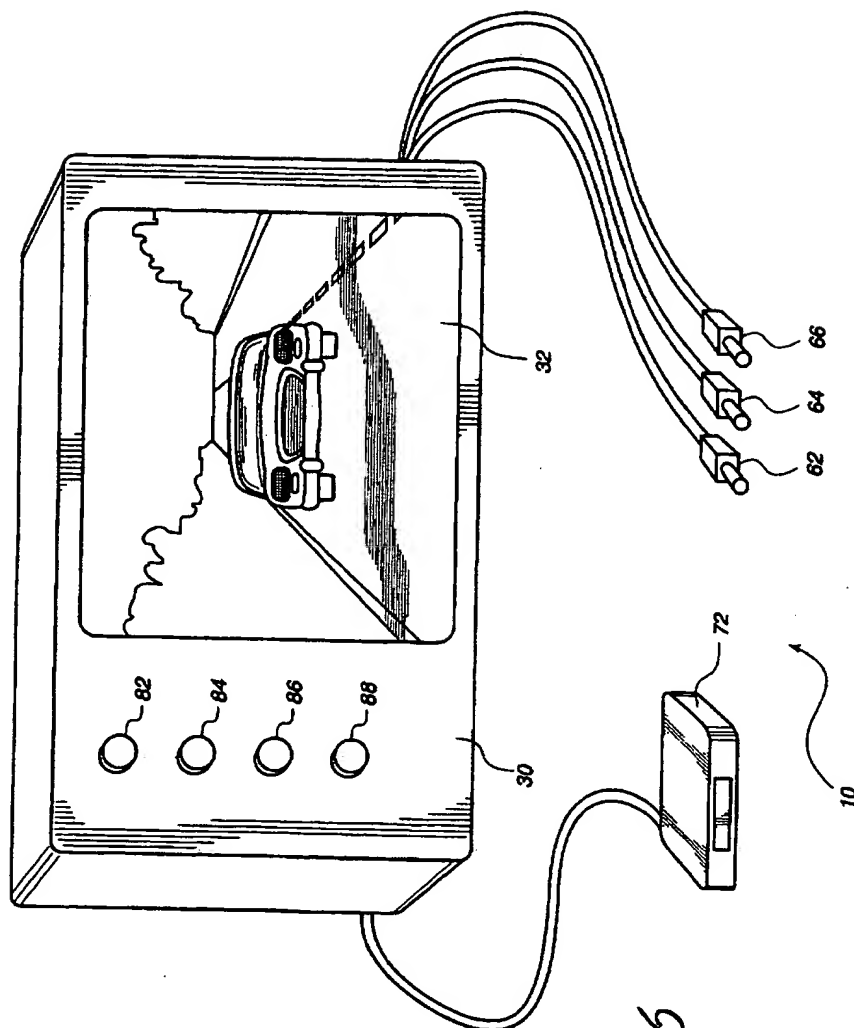


U.S. Patent

Oct. 21, 1997

Sheet 5 of 5

5,680,123

*Fig. 6*

5,680,123

1

## VEHICLE MONITORING SYSTEM

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to a vehicle monitoring system for displaying views from cameras mounted on various locations of a vehicle on a display device to detect objects not readily visible to a vehicle operator.

## 2. Description of Related Art

In modern traffic conditions, driving a motor vehicle poses the ultimately dangerous task of watching oncoming road hazards while at the same time looking backwards. Besides paying attention to various control gauges and switches in the vehicle, the driver must be aware of all oncoming road hazards and traffic control devices, including stopped cars and traffic signals. It is also necessary to look both sideways and backwards before safely changing lanes on a highway. A failure to properly look both sideways and backwards before changing lanes can lead to serious accidents which can cause property damages and even serious bodily harm or death.

Conventionally, rearview mirrors located both inside the front windshield and on the sides of vehicles so far have been the only widely accepted means for observing vehicles on the sides or behind the driver's vehicle. All such rear view and side mirrors leave at least one blind spot where the driver cannot detect a nearby vehicle. Thus, the driver must physically turn his or her head to detect such vehicles hidden in the blind spots. These blind spots generally exist right next to the rear fenders of a car or next to the rear wheels of a truck. Sometimes an entire car or motorcycle can be driving right alongside the driver's car totally undetected by the driver even after checking his rear view mirrors.

To alleviate the above problem, some newer automobiles and trucks are equipped with side view mirrors which use convex mirrors to detect vehicles in blind spots. One problem with these mirrors is that the true distance between the vehicles cannot be reasonably determined due to the optical characteristics of such mirrors.

With regard to a theft deterrence means for vehicles, the most commonly used method currently available is use of vehicle alarms which are triggered to fend off vehicle intruders. Such vehicle alarms are not equipped with a video camera and recording system to capture the image of the intruder, who is trying to break into the vehicle, to assist the law enforcement officers to later apprehend the suspect.

## SUMMARY OF THE DISCLOSURE

It is an object of the present invention to provide a video camera and display system to detect vehicles in the blind spot alongside a driver's vehicle in response to a turn signal control. Further object of the present invention is to provide a recording device to record the views from cameras mounted on various locations of the vehicle to memorialize the events that take place around the vehicle.

According to a first embodiment of the present invention, the vehicle monitoring system for use with a vehicle for detecting the presence of an object moving relative and adjacent to the vehicle includes a first video camera mounted on a right side of the vehicle to view an object present in the right region of the vehicle, a second video camera mounted on a left side of the vehicle to view an object present in the left region of the vehicle, and a third video camera mounted on a rear the vehicle to view an object present in the rear region of the vehicle. A turn signal control switch of the

2

vehicle is used for selecting for display at least one of the camera view of the surrounding regions of the vehicle. The camera view from the first video camera is selected when the turn signal control switch is enabled to represent a right turn. The camera view from the second video camera is selected when the turn signal switch is enabled to represent a left turn. The camera view from the third video camera is selected when the turn signal control switch is at a neutral position. The vehicle monitoring system also has a display apparatus for displaying the display selected by the turn signal control switch.

The vehicle monitoring system further includes a controller which is responsive to the turn signal control switch for selecting a video signal to be displayed on the display apparatus, and an activation device coupled to the controller. Moreover, the vehicle monitoring system may have a video multiplexer responsive to a control signal generated from the controller. Preferably, the video multiplexer is coupled to the first, the second and the third video cameras to provide the video signal to the display apparatus. In addition, the vehicle monitoring system may also have a video recording device coupled to the video multiplexer for recording the video signals received from the video cameras.

In accordance with the embodiment of the present invention, the activation device of the vehicle monitoring system includes a theft deterrent system, such as a vehicle alarm, equipped with a protection circuit, which activates the controller when the protection circuit is disrupted. In such a case, the controller controls the video multiplexer to provide the video signal from each one of the video cameras to at least one of the video recording device and the display apparatus in a sequential manner for a predetermined period.

The activation device may also include an impact sensor mounted on a rear bumper of the vehicle which activates the controller when the object collides with the vehicle. Similar to the above, the controller controls the video multiplexer to provide the video signal from each one of the video cameras to at least one of the video recording device and the display apparatus in a sequential manner for a predetermined period. Another type of the activation device includes a brake sensor which activates the controller when the vehicle makes a sudden stop.

These and other aspects, features and advantages of the present invention will be better understood by studying the detailed description in conjunction with the drawings and the accompanying claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

A detailed description of embodiments of the invention will be made with reference to the accompanying drawings, wherein like numerals designate corresponding parts in the several figures.

FIG. 1A is a top plan view of a vehicle monitoring system installed on a truck according to an embodiment of the present invention;

FIG. 1B is a side view of the vehicle monitoring system installed on a truck;

FIG. 2 shows video coverage regions of cameras installed on different locations of a vehicle;

FIG. 3 is a perspective view of a dash board with a display device;

FIG. 4 is a top plan view of a vehicle monitoring system installed on a sedan;

FIG. 5 is a block diagram of the preferred embodiment of the vehicle monitoring system; and

5,680,123

3

FIG. 6 shows a main control unit of the vehicle monitoring system showing a view from a camera.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A vehicle monitoring system for viewing objects around the vehicle according to an embodiment of the invention is shown in the drawings for purposes of illustration. The vehicle monitoring system is a full function wired system designed to be used with any type of vehicles, including, without limitations, trucks and sedans. A preferred embodiment of the remote control device has a full color display for displaying objects, such as automobiles, around the vehicle equipped with the vehicle monitoring system. The vehicle monitoring system also has the ability to be activated even when an automobile theft alarm is triggered. In such a case, instead of displaying what was being monitored on a display unit, the video signal is, for example, recorded into an onboard video recorder. The vehicle monitoring system preferably has a main control unit with a display device, three cameras installed on various locations of the vehicle, and sensors for activating the main control unit so that the cameras and the display are turned on.

FIGS. 1A-1B illustrate a vehicle monitoring system installed on a truck 20 according to an embodiment of the present invention. More specifically, FIG. 1A shows three video cameras 12, 14 and 16 installed on the truck 20. The video camera 12 is preferably installed on the left side of the truck 20 to detect objects in the left region B, whereas the video camera 16 is preferably installed on the right side of the truck 20 to detect objects in the right region A. The video camera 14 is preferably installed on the rear of the truck 20 to detect objects in the rear region C.

FIG. 2 illustrates video coverage regions of the video cameras installed on the truck 20. When the truck 20 is moving either forward or backward, the observation of the region C is particularly useful since any objects immediately behind the truck is difficult to observe by the truck operator. When the truck 20 is making a right turn, the observation of the region A is useful to detect any fast moving traffic in the right hand lane. The use of the video camera 16 substantially eliminates any blind spots on the right side of the truck, thus reducing any danger caused by unsuspecting operator of the truck 20. When the truck 20 is making a left turn, the observation of the region B is useful for the similar reasons noted above with respect to the region A.

FIG. 3 is a dash board showing a turn signal control switch 42, main control unit 30 and a display apparatus 32 of the present invention. In a normal driving mode, where the turn signal control switch 42 is in its neutral position 43C (i.e., a middle position), the vehicle monitoring system 10 provides a video signal from the rear camera 14 to the main control unit 30 so that the operator of the vehicle can observe the objects behind the vehicle on the display apparatus 32. The view shown on the display apparatus 32 is substantially similar to the view obtained from a rear view mirror of a vehicle equipped with conventional mirrors. When the vehicle operator needs to make a right turn, the turn signal control switch 42 is put into an up position 43A. The up position of the turn signal control switch 42 enables a video signal from the right side camera 16 to be provided to the main control unit 30, so that the objects adjacent to the right side of the vehicle can be observed on the display apparatus 30. Similarly, when the turn signal control switch 42 is put into a down position 43B, a video signal from the left side camera 12 is provided to the main control unit 30.

4

FIG. 4 is a plan view of a vehicle monitoring system installed on a sedan. The mounting of three cameras are similar to that of the truck, namely a first camera on the left side of the vehicle, a second camera on the right side of the vehicle, and a third camera on the rear side of the vehicle. In particular, the third camera may be mounted inside and adjacent to the rear window or near a tail light.

FIG. 5 illustrates a functional block diagram of the vehicle monitoring system 10 according to the preferred embodiment of the present invention. The vehicle monitoring system 10 has a main controller 60, video cameras 62, 64 and 66, a video multiplexer 68, a display unit 74, a video recorder 72, and activation devices, such as a turn signal switch 52, an alarm 54, etc. The main controller 60 receives an activation signal from one of the activation devices. For example, as noted above with regard to FIG. 3, when a turn signal control switch 52 is activated, while the vehicle is in operation, by shifting the position to an up position 43A, the main controller 60 controls the video multiplexer 68 to feed a video signal from camera-1 62 to the display 74. Similarly, when the turn signal control switch 52 is shifted to a down position 43B, the main controller 60 controls the video multiplexer 68 to feed a video signal from camera-2 64 to the display 74. When the turn signal control switch 52 is at its neutral position 43C, a video signal from camera-3 is fed to the display 74 through the video multiplexer 68.

When an impact sensor 53, an alarm 54, or a brake switch 56 is activated, the main controller 60 preferably controls the video multiplexer 68 in such a way that the video signal from the camera-1 62, camera-2 64 and camera-3 66 are provided to the video recorder 72 in a time division manner. For example, the impact sensor 53, preferably installed on the rear bumper of the vehicle, is activated when the vehicle is hit from behind, in which the main controller 60 immediately turns on all of the cameras and the video recorder 72. In addition, the main controller 60, for example, controls the video multiplexer 68 to feed the video signal from each camera to the video recorder 72 for a period of 3 seconds, and switches to another camera for the same duration. This way, views from all three cameras are recorded in real time in the video recorder 72, which can be later used to determine who was at fault or who was involved in the accident.

Similarly, while the vehicle is unattended, an alarm installed in the vehicle might be triggered when an intruder tries to break into or tamper with the vehicle. In such instances, upon activation of the alarm, the main controllers 60 activates all of the cameras and controls the video multiplexer 68 to record video signals from each camera for a fixed period of time, for example, 3 seconds.

The impact sensor 53 may be of the type which is used to activate airbags installed in a vehicle. Only difference is that the impact sensor 53 for the preferred embodiment of the present invention is installed on a rear bumper of the vehicle rather than a front bumper. A similar sensor may be also installed on the side of the vehicle, for example, in a form of a body guard strip, to activate the vehicle monitoring system 10 when the vehicle is hit from the side.

The break switch 56 is designed to be activated when the vehicle is suddenly stopped to avoid a collision or the like. For example, the break switch 56 is activated when the break pedal is depressed with force. Preferably, the break switch may be installed underneath the break pedal in such a way that when the break pedal is depressed in a normal driving and stop condition, the break switch 56 is not triggered.

When the vehicle monitoring system 10 is in operation, the main controller 60 continuously monitors all of the

5,680,123

5

buttons mounted on the front panel of the main controller 60 to determine whether they have been depressed. A processor module (not illustrated) in the main controller 60 advises the main controller 60 whenever a button is pressed or signals from various activation sensors are received. In the preferred embodiment, the processor module is a 386 microprocessor. However, any other suitable microprocessor could be used. The software to control the main controller 60 resides on either an EPROM or a Flash EPROM, or may be loaded into the main controller 60 from a mass storage device, such as a hard disk drive (not illustrated) or a floppy disk drive (not illustrated).

The main controller 60, which is connected to the video multiplexer 68 may include a display controller to control the video recorder 72 and the display 74. For example, an operator might desire that, while the vehicle is in operation, only the display 74 is activated when the turn signal control switch 52 is used, and that the video recorder 72 be activated only when the brake switch 56 or the impact sensor 53 is activated. Alternatively, when the vehicle is not in operation, the vehicle monitoring system 10 can be set up so that only the video recorder 72 is activated without the display 74.

The display 74 used with the vehicle monitoring system 10 is preferably about a 6 inch LCD display configured to display NTSC (National Television System Committee) video signals from a remote video camera. A preferred display is a Sharp LQ6NC02 TFT-LCD display, which has a small depth dimension for compact construction of the main control unit 30, as shown in FIG. 3, although any other suitable display may be utilized, such as a CRT. The display 74 preferably has a resolution sufficiently high to clearly display the views from surrounding regions of the vehicle.

FIG. 6 shows the main control unit 30 showing a view from a camera. The main control unit 30 has a plurality of control switches which are in the form of push button switches. The control switches are used to manually control the vehicle monitoring system 10. For example, a first switch 82 is a power switch for activating or deactivating the vehicle monitoring system 10. Once the vehicle monitoring system 10 is turned on, and the operator of the vehicle wishes to observe the views from different cameras, a second switch 84 may be depressed to select a different camera. In particular, when the second switch 84 is pressed once, the camera-1 62 is preferably selected. When the second switch 84 is pressed again, the camera-2 64 is preferably selected. Once all of the cameras have been selected, the camera-1 62 is selected again upon activation of the second button 84. A third switch 86 may be used to manually activate the video recorder 72, so that any views displayed on the display 74 is also recorded. A fourth switch 88 may be used to manually activate the scan mode of the vehicle monitoring system 10. In the scan mode, the views from the cameras installed on different locations of the vehicle are displayed and recorded one at a time for a fixed period of time, for example, 3 seconds. In alternative embodiments of the present invention, there may be other switches installed in the main control unit 30 to allow other functions. Furthermore, there may also be a remote control unit (not illustrated) connected to the main control unit for controlling the vehicle monitoring system 10 from, for example, a back seat of the vehicle.

As an alternative embodiment of the above described vehicle monitoring system a display touch screen and on screen menu may be implemented with the existing display and switches to select different viewing modes and functions. Moreover, the display of the main control unit 30 may display the views from at least two cameras. Such display

6

may be incorporated as a picture-in-picture or a split screen format. Furthermore, each camera may be equipped with a zoom lens to provide a closer up view of the surrounding regions of the vehicle. Still further, the vehicle monitoring system may have more than three cameras to cover more regions, such as the front of the vehicle.

While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

The presently disclosed embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims, rather than the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. A monitoring system for use with a vehicle for detecting the presence of an object moving relative and adjacent to the vehicle, the monitoring system comprising:

a plurality of video cameras mounted on the vehicle, in which the plurality of video cameras are adapted to view surrounding regions of the vehicle;

an activation device for selecting for display at least one of the camera views of the surrounding regions of the vehicle, wherein the activation device is a brake sensor which is triggered when the vehicle makes a sudden stop; and

a display apparatus for displaying at least one of the camera views in response to the activation device.

2. A monitoring system for use with a vehicle for detecting the presence of an object moving relative and adjacent to the vehicle, the monitoring system comprising:

a first video camera mounted on a right side of the vehicle to view an object present in the right region of the vehicle;

a second video camera mounted on a left side of the vehicle to view an object present in the left region of the vehicle;

a third video camera mounted on a rear the vehicle to view an object present in the rear region of the vehicle;

a turn signal control switch for selecting for display at least one of the camera view of the surrounding regions of the vehicle, wherein the camera view from the first video camera is selected when the turn signal control switch is enabled to represent a right turn, the camera view from the second video camera is selected when the turn signal switch is enabled to represent a left turn, and the camera view from the third video camera is selected when the turn signal control switch is at a neutral position; and

a display apparatus for displaying the display selected by the turn signal control switch.

3. A monitoring system according to claim 2, further including

a controller responsive to the turn signal control switch for selecting a video signal to be displayed on the display apparatus; and

an activation device coupled to the controller.

4. A monitoring system according to claim 3, further including a video multiplexer responsive to a control signal generated from the controller, wherein the video multiplexer is coupled to the first, the second and the third video cameras to provide the video signal to the display apparatus.

5,680,123

7

5. A monitoring system according to claim 4, further including a video recording device coupled to the video multiplexer.

6. A monitoring system for use with a vehicle for detecting the presence of an object moving relative and adjacent to the vehicle, the monitoring system comprising:

a first video camera mounted on a right side of the vehicle to view an object present in the right region of the vehicle;

a second video camera mounted on a left side of the vehicle to view an object present in the left region of the vehicle;

a third video camera mounted on a rear the vehicle to view an object present in the rear region of the vehicle;

a turn signal control switch for selecting for display at least one of the camera view of the surrounding regions of the vehicle, wherein the camera view from the first video camera is selected when the turn signal control switch is enabled to represent a right turn, the camera view from the second video camera is selected when the turn signal switch is enabled to represent a left turn, and the camera view from the third video camera is selected when the turn signal control switch is at a neutral position;

a display apparatus for displaying the display selected by the turn signal control switch;

a controller responsive to the turn signal control switch for selecting a video signal to be displayed on the display apparatus;

a video multiplexer responsive to a control signal generated from the controller, wherein the video multiplexer is coupled to the first, the second and the third video cameras to provide the video signal to the display apparatus;

a video recording device coupled to the video multiplexer; an activation device coupled to the controller, wherein the activation device includes a theft deterrent system equipped with a protection circuit and installed in the vehicle, which activates the controller when the protection circuit is disrupted, wherein the controller controls the video multiplexer to provide the video signal from each one of the video cameras in a sequential manner for a predetermined period to at least one of the video recording device and the display apparatus.

7. A monitoring system for use with a vehicle for detecting the presence of an object moving relative and adjacent to the vehicle, the monitoring system comprising:

a first video camera mounted on a right side of the vehicle to view an object present in the right region of the vehicle;

a second video camera mounted on a left side of the vehicle to view an object present in the left region of the vehicle;

a third video camera mounted on a rear the vehicle to view an object present in the rear region of the vehicle;

a turn signal control switch for selecting for display at least one of the camera view of the surrounding regions of the vehicle, wherein the camera view from the first video camera is selected when the turn signal control switch is enabled to represent a right turn, the camera view from the second video camera is selected when the turn signal switch is enabled to represent a left turn, and the camera view from the third video camera is

8

selected when the turn signal control switch is at a neutral position;

a display apparatus for displaying the display selected by the turn signal control switch;

a controller responsive to the turn signal control switch for selecting a video signal to be displayed on the display apparatus;

a video multiplexer responsive to a control signal generated from the controller, wherein the video multiplexer is coupled to the first, the second and the third video cameras to provide the video signal to the display apparatus;

a video recording device coupled to the video multiplexer;

an activation device coupled to the controller, wherein the activation device includes an impact sensor mounted in the vehicle which activates the controller when the object collides with the vehicle, wherein the controller controls the video multiplexer to provide the video signal from each one of the video cameras in a sequential manner for a predetermined period to at least one of the video recording device and the display apparatus.

8. A monitoring system for use with a vehicle for detecting the presence of an object moving relative and adjacent to the vehicle, the monitoring system comprising:

a first video camera mounted on a right side of the vehicle to view an object present in the right region of the vehicle;

a second video camera mounted on a left side of the vehicle to view an object present in the left region of the vehicle;

a third video camera mounted on a rear the vehicle to view an object present in the rear region of the vehicle;

a turn signal control switch for selecting for display at least one of the camera view of the surrounding regions of the vehicle, wherein the camera view from the first video camera is selected when the turn signal control switch is enabled to represent a right turn, the camera view from the second video camera is selected when the turn signal switch is enabled to represent a left turn, and the camera view from the third video camera is selected when the turn signal control switch is at a neutral position;

a display apparatus for displaying the display selected by the turn signal control switch;

a controller responsive to the turn signal control switch for selecting a video signal to be displayed on the display apparatus;

a video multiplexer responsive to a control signal generated from the controller, wherein the video multiplexer is coupled to the first, the second and the third video cameras to provide the video signal to the display apparatus;

a video recording device coupled to the video multiplexer;

an activation device coupled to the controller, wherein the activation device includes a brake sensor which activates the controller when the vehicle makes a sudden stop, wherein the controller controls the video multiplexer to provide the video signal from each one of the video cameras in a sequential manner for a predetermined period to at least one of the video recording device and the display apparatus.

\* \* \* \* \*